D-E440/E441/E441SR/E443/E445/ E446CK/E449CK

SERVICE MANUAL

Ver 1.0 1999.02

Photo : D-E441

US Model
D-E441/E445/E446CK/E449CK

Canadian Model
D-E441/E445/E446CK

AEP Model
D-E440/E441/E441SR/E443/E445/E446CK

UK Model
D-E441/E441SR/E443/E445/E446CK

E Model
D-E441/E443/E445/E446CK

Australian Model
D-E441/E445/E446CK

Chinese Model
D-E441/E445

Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM-2811EAA
Optical Pick-up Type	DAX-11E

SPECIFICATIONS

CD player

System
Compact disc digital audio system
Laser diode properties
Material: GaAIAs
Wavelength : λ= 780 nm
Emission duration: Continuous
Laser output : Less than 44.6 µW (This output is the value measured at a distance of 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)
Error correction
Sony Super Strategy Cross Interleave Reed Solomon Code
D-A conversion
1-bit quartz time-axis control
Frequency response
20 - 20,000 Hz $^{+1}_{-2}$ dB (measured by EIAJ CP-307)
Output (at 4.5 V input level)
Headphones (stereo minijack)
15 mW + 15 mW at 16 ohms
Line output (stereo minijack)
Output level 0.7 V rms at 47 kilohms
Recommended load impedance over 10 kilohms

General

Power requirements
For the area code of the model you purchased, check the upper left side of the bar code on the package.
- Sony BP-DM10 Rechargeable battery: 2.4 V DC, Ni-Cd, 650 mAh
  Sony BP-DM20 Rechargeable battery: 2.4 V DC, Ni-MH, 1,200 mAh
- Two LR6 (size AA) batteries: 3 V DC
- AC power adaptor (DC IN 4.5 V jack):
  US, Canadian, Central and South America model: 120 V, 60 Hz
  AEP, German, French, EE, E13 model: 220 - 230 V, 50/60 Hz
  UK model: 230 - 240 V, 50 Hz
  EA model: 110 - 240 V, 50/60 Hz
  AUS model: 240 V, 50 Hz
  E33 model: 100 - 240 V, 50/60 Hz
  Hong Kong model: 220 V, 50/60 Hz
  Chinese, Argentine model: 220 V, 50 Hz
- Sony CPM-300P mount plate for use on car battery : 4.5V DC

Dimensions (w/h/d) (without projecting parts and controls)
Approx. 129 x 28 x 146 mm
(5 1/8 x 1 1/8 x 5 3/4 in.)
Mass (without rechargeable battery)
Approx. 220 g (7.8 oz)
Operating temperature
5°C - 35°C (41°F - 95°F)

Supplied accessories

For the area code of the model you purchased, check the upper left side of the bar code on the package.
D-E440
Earphones (1)
D-E441
AC power adaptor (1)
Headphones (1)*1
Earphones (1)*2
AC plug adaptor (1)*3
*1 Supplied with US model
*2 Not supplied with US model
*3 Supplied with E33, E13 and EA models

– Continued on page 2 –

COMPACT DISC COMPACT PLAYER

MICROFILM

SONY

D-E441SR
AC power adaptor (1)
Earphones (1)
Active speaker system (1)
D-E443
AC power adaptor (1)
Earphones (1)
Rechargeable battery (1)
AC plug adaptor (1)*
* Supplied with E33, E13 and EA models
D-E445
AC power adaptor (1)
Headphones with remote control (1) *1
Earphones with remote control (1) *2
Rechargeable battery (1)
AC plug adaptor (1)*3
*1 Supplied with US model
*2 Not supplied with US model
*3 Supplied with E13 model
D-E446CK
AC power adaptor (1)
Headphones (1) *1
Earphones (1) *2
Car battery cord (1)
Car connecting pack (1)
Velcro tape (2)
Spare fuse (1)
Spiral tube (1)
AC plug adaptor (1)*3
*1 Supplied with US model
*2 Not supplied with US model
*3 Supplied with E33, E13 and EA models
D-E449CK
AC power adaptor (1)
Rechargeable battery (1)
Headphones with remote control (1)
Car battery cord (1)
Car connecting pack (1)
Velcro tape (2)
Spare fuse (1)
Spiral tube (1)

Design and specifications are subject to change without notice.

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SAFETY-RELATED COMPONENT WARNING!!

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.
REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

DANGER
Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This Compact Disc player is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the bottom exterior.

Flexible Circuit Board Repairing
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
SERVICING NOTES

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30cm away from the objective lens.

Before Replacing the Optical pick-up Block

Please be sure to check thoroughly the parameters as per the "Optical pick-up Block Checking Procedure" (Part No. : 9-960-027-11) issued separately before replacing the optical Pick-up block.
Note and specifications required to check are given below.

- FOK output : IC501 ⑫ pin
  When checking FOK, remove the lead wire to disc motor.
- S curve P-to-P value : 1.2±0.3Vp-p IC501 ㉛ pin. (Connect pin ⑫ of IC501 (TP880) and ③ of IC501 (GND) with a jumper wire).
  When checking S curve P-to-P value, remove the lead wire to disc motor.
- Adjusted part for focus gain adjustment : RV503
- RF signal P-to-P value : 0.8 – 1.2Vp-p
- Traverse signal P-to-P value : 1.0 – 2.4Vp-p
- The repairing grating holder is impossible.
- Adjusted part for tracking gain adjustment : RV502

Precautions for Checking Emission of Laser Diode

Laser light of the equipment is focused by the object lens in the optical pick-up so that the light focuses on the reflection surface of the disc. Therefore, be sure to keep your eyes more then 30cm apart from the object lens when you check the emission of laser diode.

Laser Diode Checking Methods

During normal operation of the equipment, emission of the laser diode is prohibited unless the upper panel is closed while turning ON the S801 (push switch type).
The following two checking methods for the laser diode are operable.

Method-1 (In the service mode or normal operation) : Emission of the laser diode is visually checked.

1. Open the upper lid.
2. Push the S801 as shown in Fig. 1 .
3. Check the object lens for confirming normal emission of the laser diode. If not emitting, there is a trouble in the automatic power control circuit or the optical pick-up. During normal operation, the laser diode is turned ON about 2.5 seconds for focus searching.

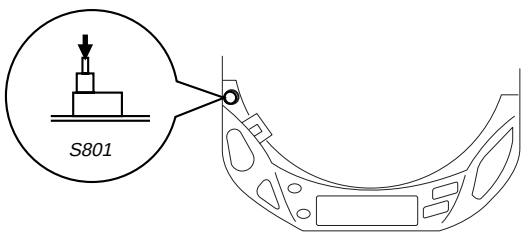
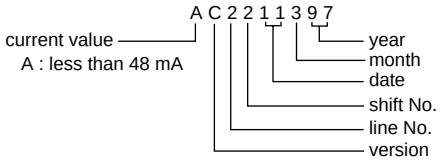


Fig.1 Method to push S801

Method-2 (In the service mode or normal operation) : Check the value of current flowing in the laser diode.

1. Remove the upper panel.
2. Read the current printed on the rear side of the optical pick-up. (Print on the rear side of the optical pick-up)
3. Connect a level meter as shown in Fig. 2
4. Press the ▶II key.



5. Calculate the current value by the reading of the digital voltmeter.
   Reading of the tester (V) ÷ 4.7 (Ω) = current value (A)
   (Example) Reading of the digital voltmeter of 0.2256 V :
   0.2256 V ÷ 4.7 Ω = 0.048 (A) = 48 mA
6. Check that the current value is within the following range.
   - Current value of the label $^{+5}_{-11}$ mA(25°C)
     Variation by temperature : 0.4mA / °C
     Current increases with temperature increased.
     Current decreases with temperature decreased.

   If the current is more than the range above, there is a trouble in the automatic power control circuit or the laser diode is in deterioration. If less than the range, a trouble exists in the automatic power control circuit or the optical pick-up.

[MAIN BOARD] (Conductor side)

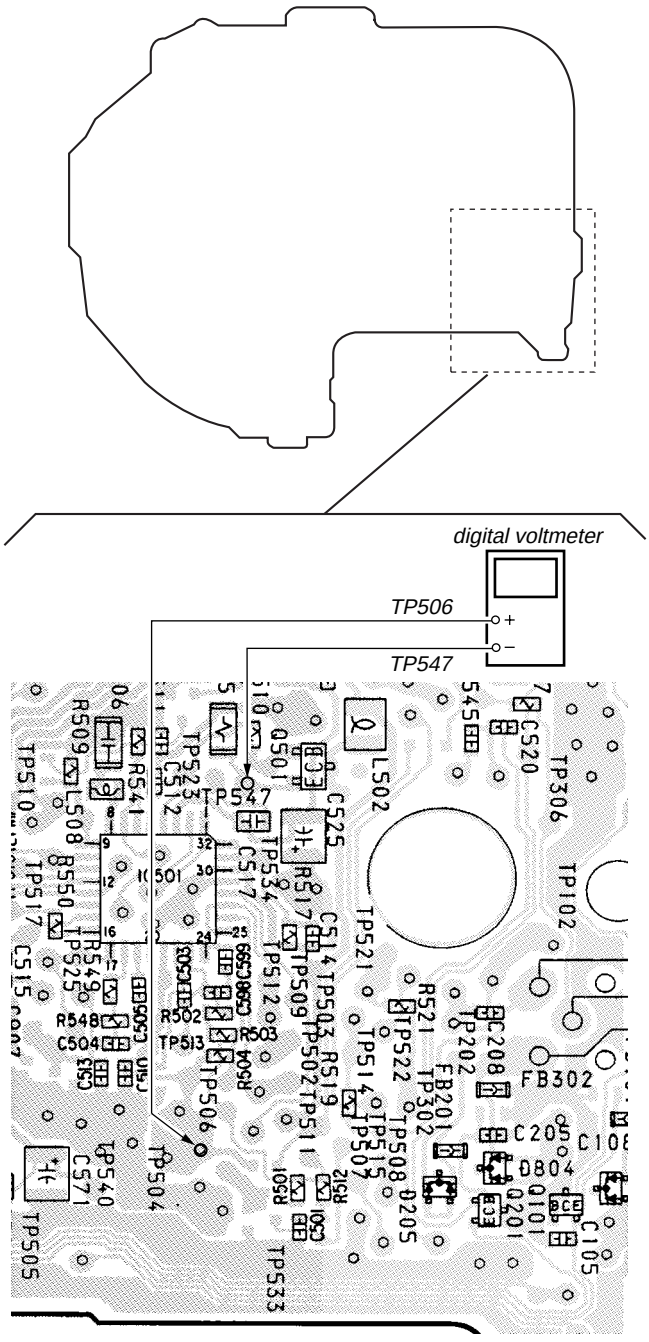
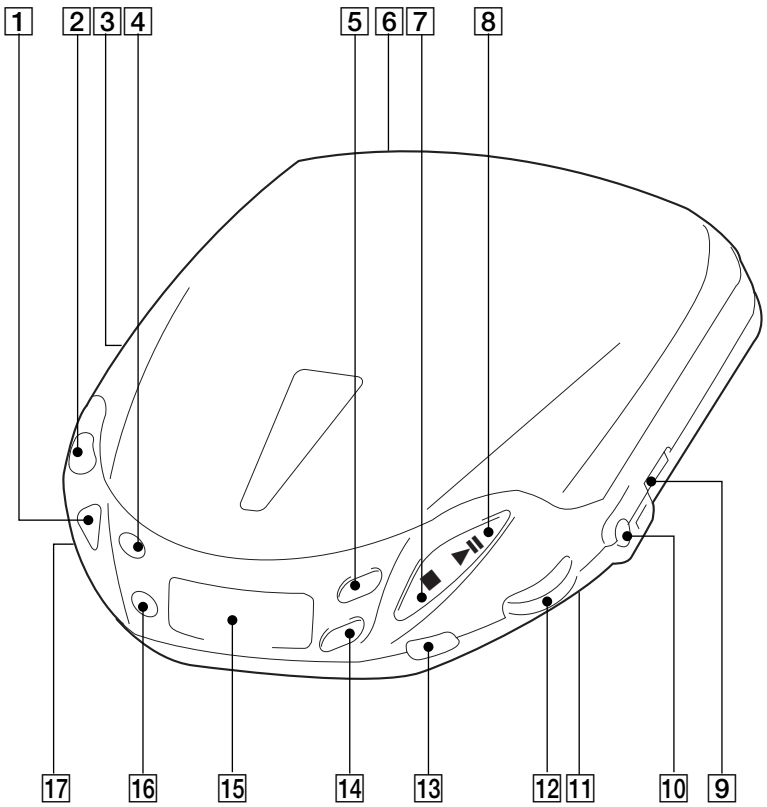


Fig. 2 Digital Voltmeter Connecting Location

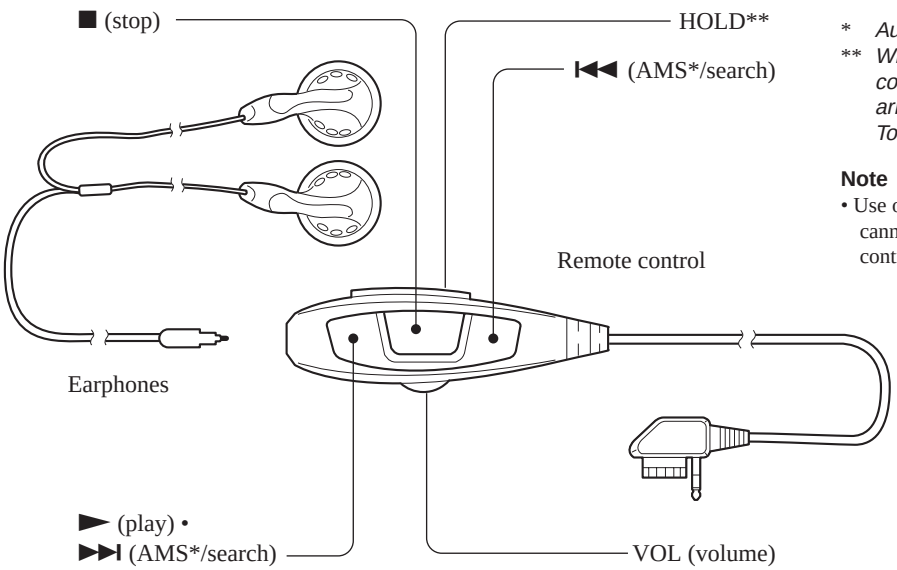
SECTION 2
GENERAL

LOCATION AND FUNCTION OF CONTROLS



1	ESP (Electronic Shock Protection) button	10	∩ /Remote jack
2	OPEN button	11	AVLS switch
3	DC IN 4.5V jack	12	VOLUME control
4	PLAY MODE button	13	Sound switch
5	▶▶I FF button	14	I◀◀ FR button
6	LINE OUT jack	15	Information display panel
7	■ STOP button	16	REPEAT/ENTER button
8	▶II Play/pause button	17	HOLD switch
9	OFF-RESUME-ON switch		

Volume control RM-DM29 : (D-E445/E449CK)



* *Automatic Music Sensor*

** *When you are not using the remote control, slide HOLD in the direction of the arrow to prevent any accidental operation. To unlock, slide HOLD back.*

Note

• Use only the supplied remote control. You cannot operate this player with the remote control supplied with other models.

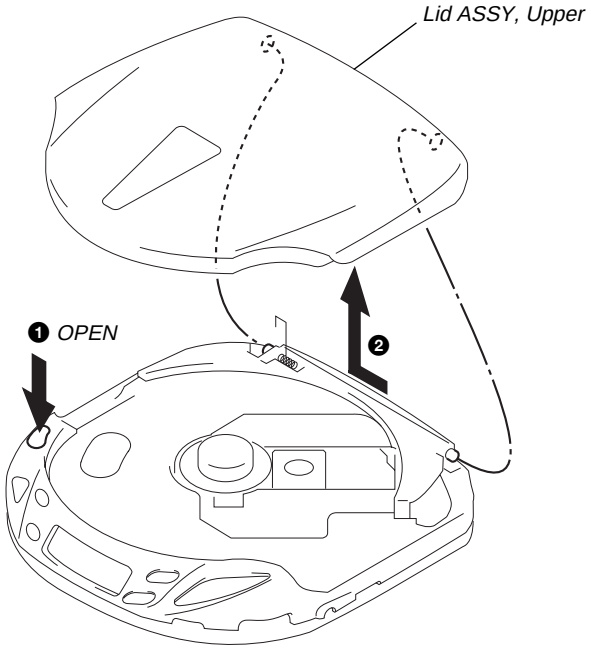
SECTION 3
DISASSEMBLY

● The equipment can be removed using the following procedure.

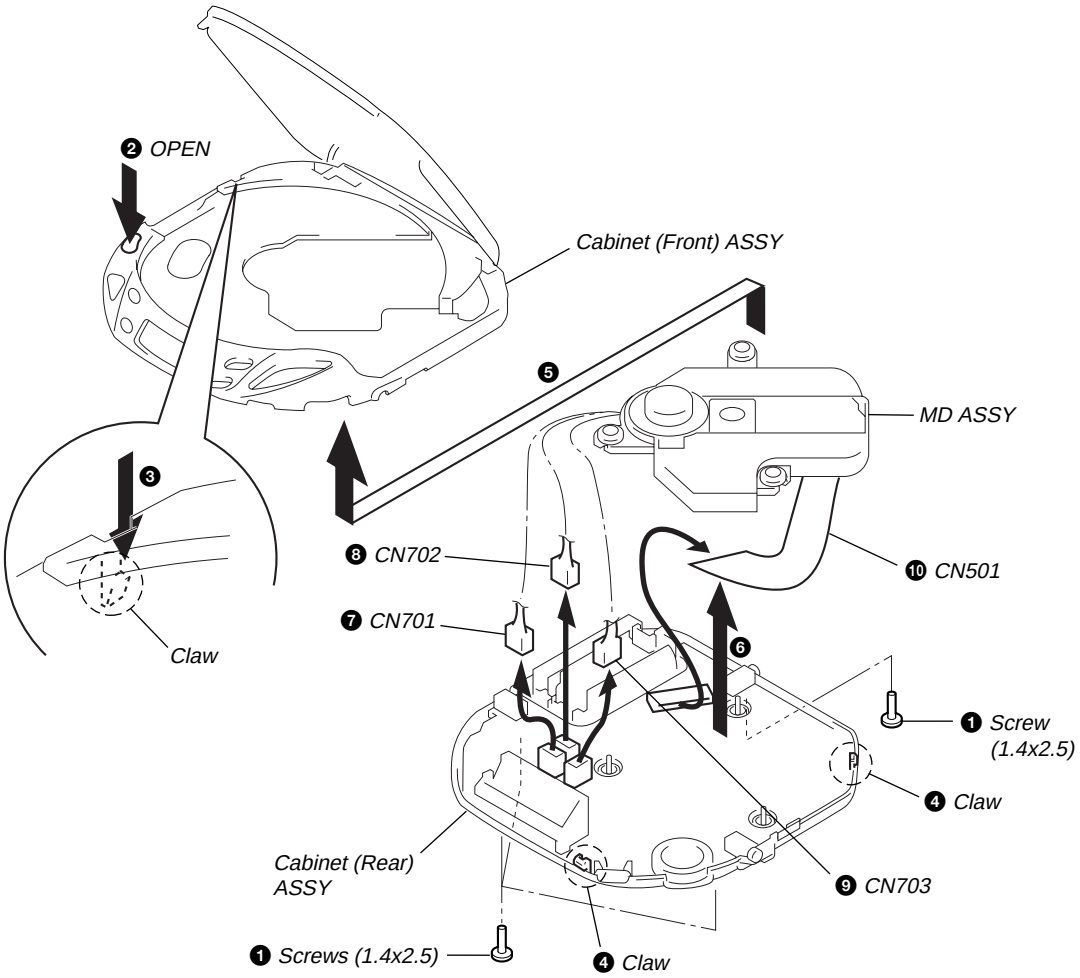
Set → Lid ASSY, Upper
Set → Cabinet (Front) ASSY
Set → Cabinet (Rear) ASSY, MD ASSY → Main board

Note : Follow the disassembly procedure in the numerical order given.

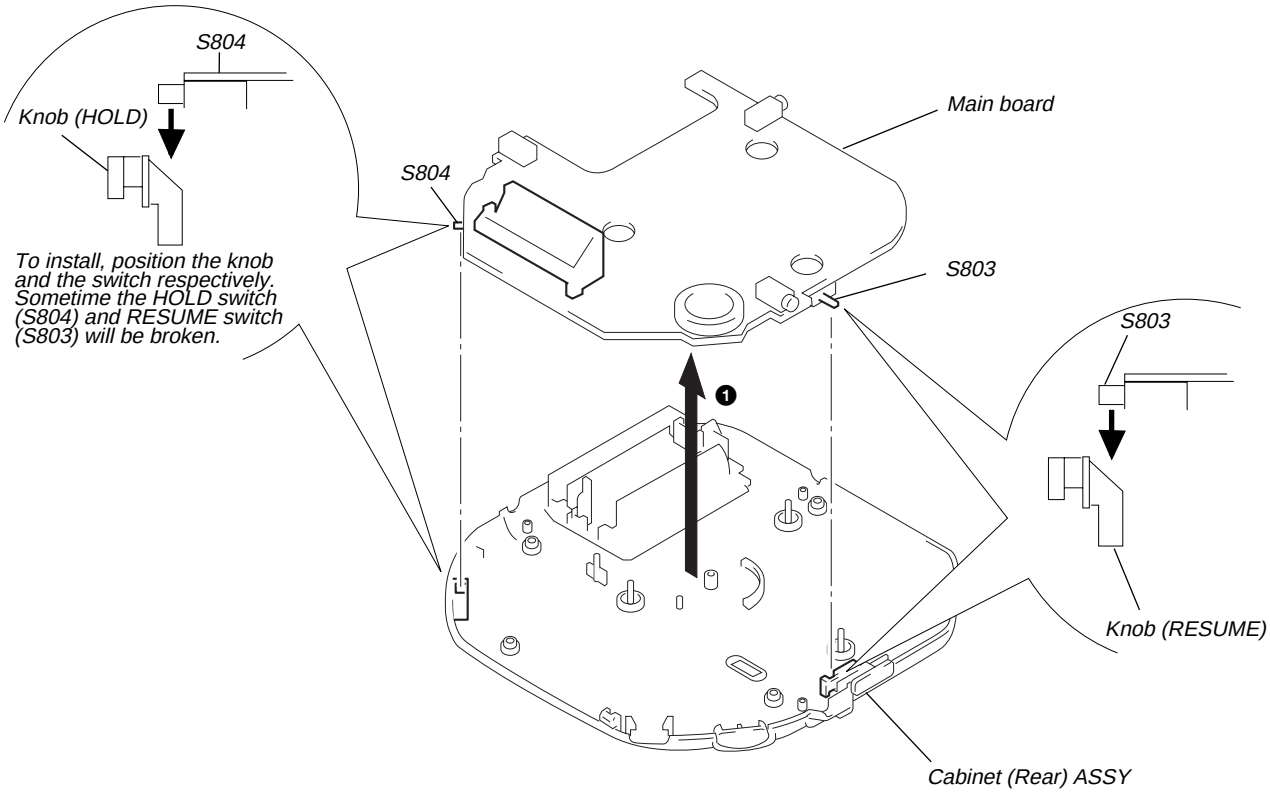
3-1. LID ASSY, UPPER



3-2. CABINET (FRONT) ASSY, CABINET (REAR) ASSY, MD ASSY



3-3. MAIN BOARD



SECTION 4
SERVICE MODE

Service Mode (service program)

The equipment is provided with a service program built in the microcomputer, like conventional models.
Service program operation methods are described in the following.

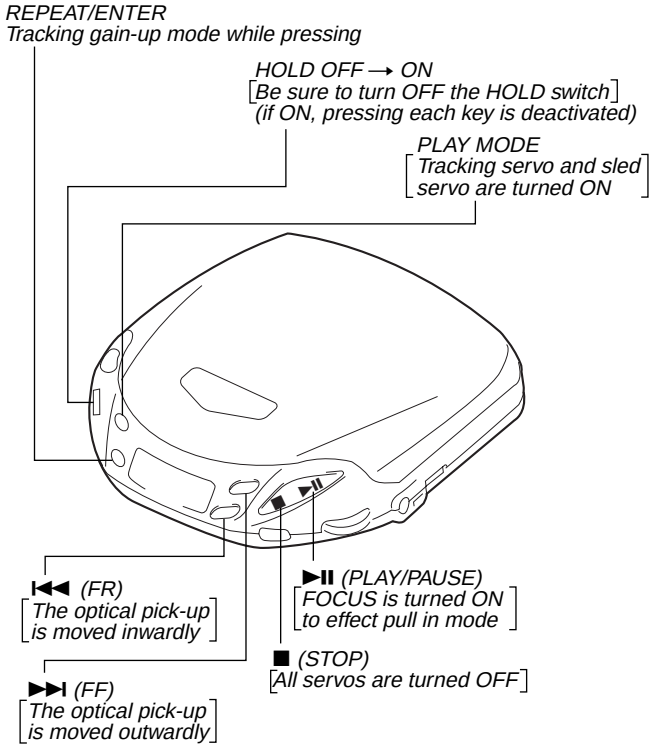

REPEAT/ENTER
Tracking gain-up mode while pressing
HOLD OFF → ON
Be sure to turn OFF the HOLD switch
(if ON, pressing each key is deactivated)
PLAY MODE
Tracking servo and sled servo are turned ON
I◄◄ (FR)
The optical pick-up is moved inwardly
►II (PLAY/PAUSE)
FOCUS is turned ON to effect pull in mode
■ (STOP)
All servos are turned OFF
►►I (FF)
The optical pick-up is moved outwardly

Fig. 3 Layout of each key

• Step 1 (Service mode setting method)

1. Turn OFF the HOLD switch the external power supply disconnected (power is not applied to the set).
2. Solder across the T802 (TEST) terminals (pin ㊿, IC801 (TEST) is grounded).
3. Connect an external power supply.
   Thus, the set is switched to the service mode.

• Step 2 (Operation in the service mode)

1. Once the service mode is effected, the LCD displays 5 indications each of which is repeatedly displayed.
   However, the following operations can be activated even if LCD indication is effected.
2. By pressing the ►►I or I◄◄ key, the optical pick-up movable inwardly or outwardly. However, if this is activated, tracking servo and sled servo are turned OFF, so it can be turned ON by pressing the PLAY MODE key, if required.
3. By pressing the REPEAT/ENTER key, the tracking gain-up mode becomes active.
4. By pressing the ►II key, focus is turned ON from focus searching while entering CLV-S (pull-in mode).
   Without disc, focus searching is repeated continuously.
5. By pressing the PLAY MODE key, tracking servo, sled servo and CLV-A (servo in PLAY) are turned ON.
6. When 4. and 5. are performed, playing begins. No muting is ON in the service mode.
7. By pressing the ■ key, all servos (focus tracking and sled) are turned OFF. However, the disc motor revolves for a while by inertia.

• Step 3 (Resetting service mode)

1. Be sure to disconnect the external power supply and remove the solder bridge at the TEST terminals connected in setting.
2. The set thus becomes available for normal operation.

– MAIN BOARD – (Side A)

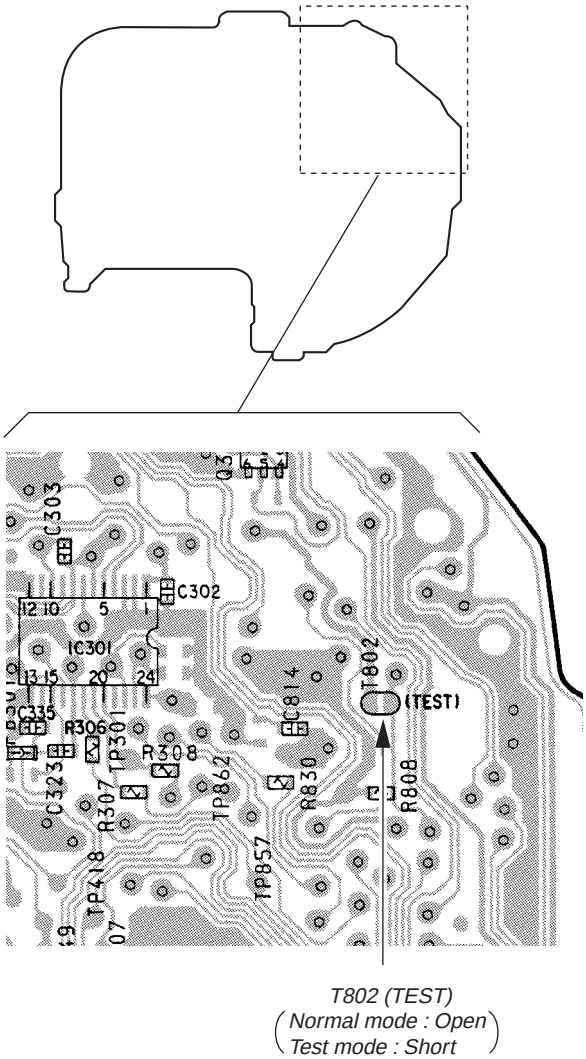


Fig. 4 Location of test terminal

SECTION 5
ADJUSTMENTS

CD SECTION

Precautions for Adjustment

1. Before beginning adjustment, set the equipment to service mode. After the completion of adjustment, be sure to reset the service mode.
   For more information, see "Service Mode (service program)" on page 7.
2. Perform adjustments in the order given.
3. Use the disc (YEDS-18. Part No. 3-702-101-01) unless otherwise indicated.
4. Power supply voltage requirement : DC 4.5 V
   HOLD switch : OFF
   VOLUME : Minimum
   SOUND switch : NORM
   AVLS switch : OFF

Before Beginning Adjustment

Set the equipment to service mode (See page 7) and check the following.
If there in an error, repair the equipment.

• Checking of the sled motor

1. Open the upper panel.
2. Press the ▶▶I and I◀◀ keys and check that the optical pick-up can move smoothly without sluggishness or abnormal noise in innermost periphery ⟶ outermost periphery ⟶ innermost periphery.
   ▶▶I : The optical pick-up moves outwardly
   I◀◀ : The optical pick-up moves inwardly

• Checking of focus searching

1. Open the upper panel.
2. Press the ▶II key. (Focus searching operation is activated continuously).
3. Check the object lens of the optical pick-up for smooth up/down motion without sluggishness or abnormal noise.
4. Press the ■ key.
   Check that focus searching operation is deactivated. If not, again press the ■ key slightly longer.

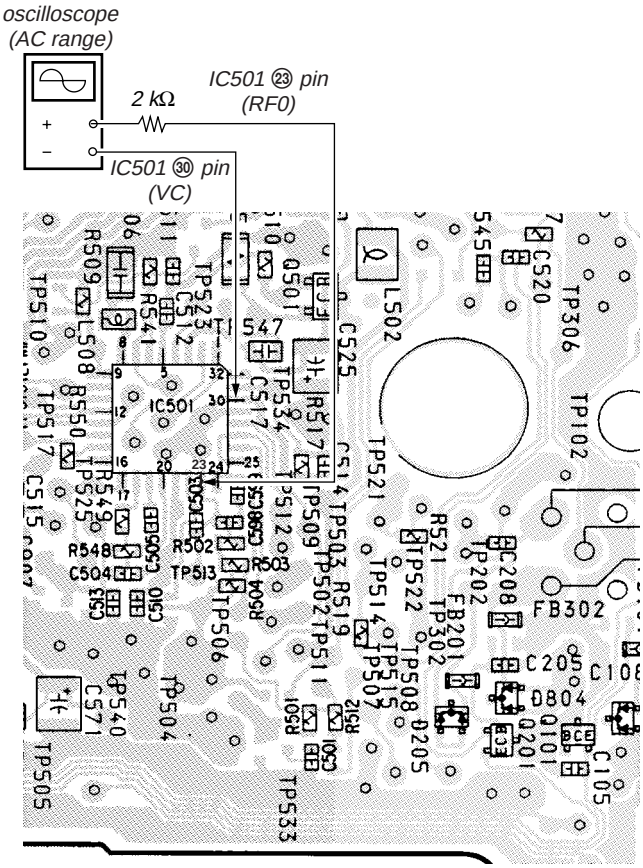
Focus Bias Check

Condition :

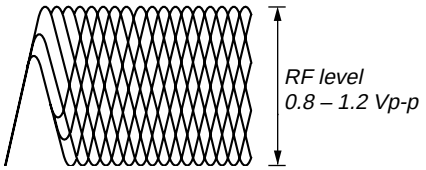
• Hold the set in horizontal state.

Procedure :

[MAIN BOARD] (Side B)



1. Set the equipment to service mode stop state (See page 7).
2. Connect the oscilloscope between IC501 ㉓ pin (RF0) and ㉚ pin (VC) on the MAIN board.
3. Move the optical pick-up by Pressing the ▶▶I and I◀◀ keys.
4 Put the disc (YEDS-18).
5. Press the ▶II key.
   (From focus searching, focus is turned ON while entering CLV drawing-in mode. Tracking and sled are turned OFF.)
6. Press the PLAY MODE key. (Both tracking and sled are turned ON).
7. Check the oscilloscope waveform is as shown below.
   A good eye pattern means that the diamond shape (◊) in the center of the waveform can be clearly distinguished.



• RF Signal Reference Waveform (eye pattern)
  To watch the eye pattern, set the oscilloscope to AC range and increase the vertical sensitivity of the oscilloscope for easy watching.

8. Stop removing of the motor by pressing the ■ key.
9. After the completion of adjustment, reset service mode. (See page 7)

Focus/Tracking Gain Adjustment

A servo analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up relative to mechanical noise and mechanical shock when the 2-axis device operate. However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.

This adjustment has to be performed upon replacing any of the following parts :

- Optical pick-up
- RV503 (Focus gain)
- RV502 (Tracking gain)

Normally, be sure not to move RV503 (focus gain) and RV502 (tracking gain).

– Focus Gain Adjustment –

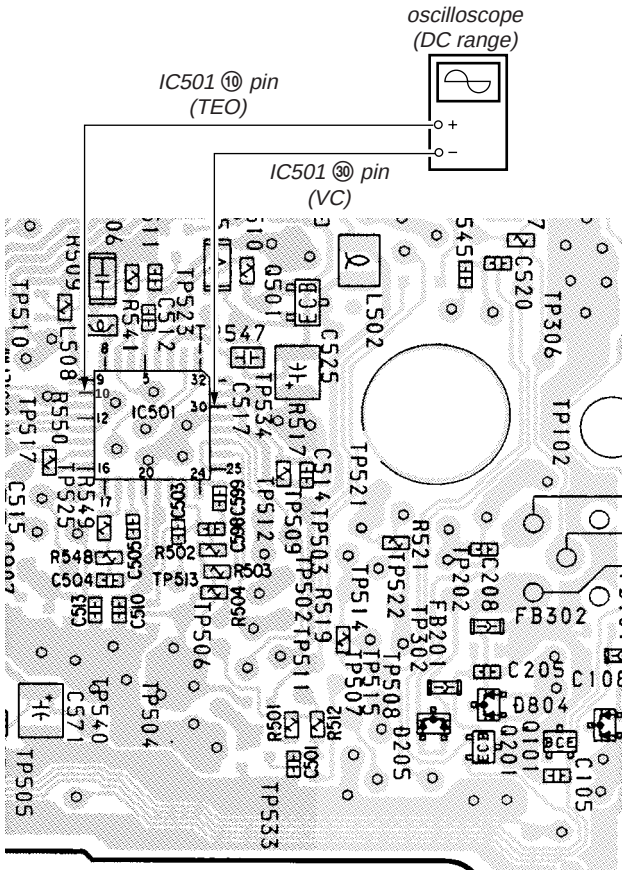
Procedure :

This adjustment is not performed. If focus gain RV503 is turned, set to mechanical center

– Tracking Gain Adjustment –

(perform at normal operation)

[MAIN BOARD] (Side B)



1. Place the optical pick-up level, horizontally. (If the optical pick-up is not level, the 2-axis device will be weighted and adjustment cannot be done.)
2. Connect the oscilloscope between IC501 ⑩ pin (TEO) and ㉚ pin (VC) on the MAIN board.
3. Set the disc (YEDS-18) and Press the ▶II (▶▶I) key.
4. Turn RV502 slightly clockwise (tracking gain drops) and obtain a waveform with a fundamental wave (waveform has large waves) as in Figure 1 .
5. Turn RV502 slowly counterclockwise (tracking gain rises) until the fundamental wave disappears (no large waves) as in Figure 2.
6. Set RV502 to the position about 30 °counterclockwise from the position obtained in step 5. If RV502 contact point is more than 90 ° counterclockwise from mechanical center, tracking gain is too high. In this case, readjust from step 4.
7. Press ▶II (▶▶I) or I◀◀ keys and observe the 100 track jump waveform. Check that no traverse waveform appears for both ▶II (▶▶I) or I◀◀ directions. (See Figures 3 and 4.) It is acceptable if the traverse waveform appears only now and then, but if it appears constantly raise tracking gain slightly and check step 7 again.
8. Check that there is no abnormal amount of operation noise (white noise) from the 2-axis device. If there is, tracking gain is too high, readjust starting with step 4.

The waveforms are those measured with the oscilloscope set as shown below.

- VOLT/DIV : 50mV
- TIME/DIV : 5mS
- Waveform when tracking gain lowered.
  Fundamental wave appears (large waves).

Fig. 1

- Waveform when fundamental wave disappears (no large waves).

Fig. 2

- Waveform when no traverse waveform during 100 track jump. (Brake application is smooth because of adjustment.)

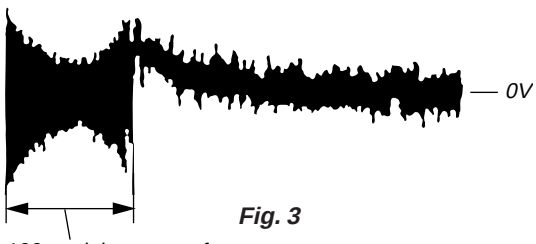


Fig. 3

- Waveform when no traverse waveform during 100 track jump. (Brake application is poor because of adjustment.)

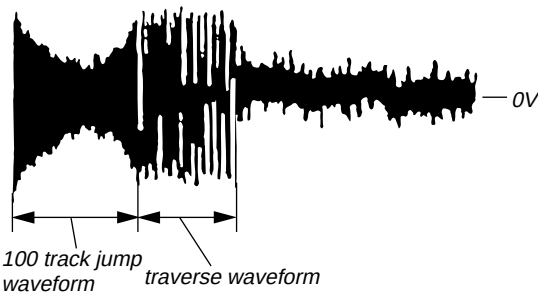
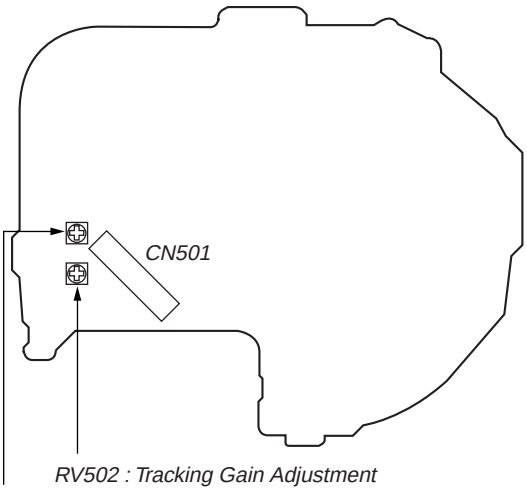


Fig. 4

Adjustment Location :

MAIN BOARD] (Side A)



RV502 : Tracking Gain Adjustment

RV503 : Focus Gain Adjustment

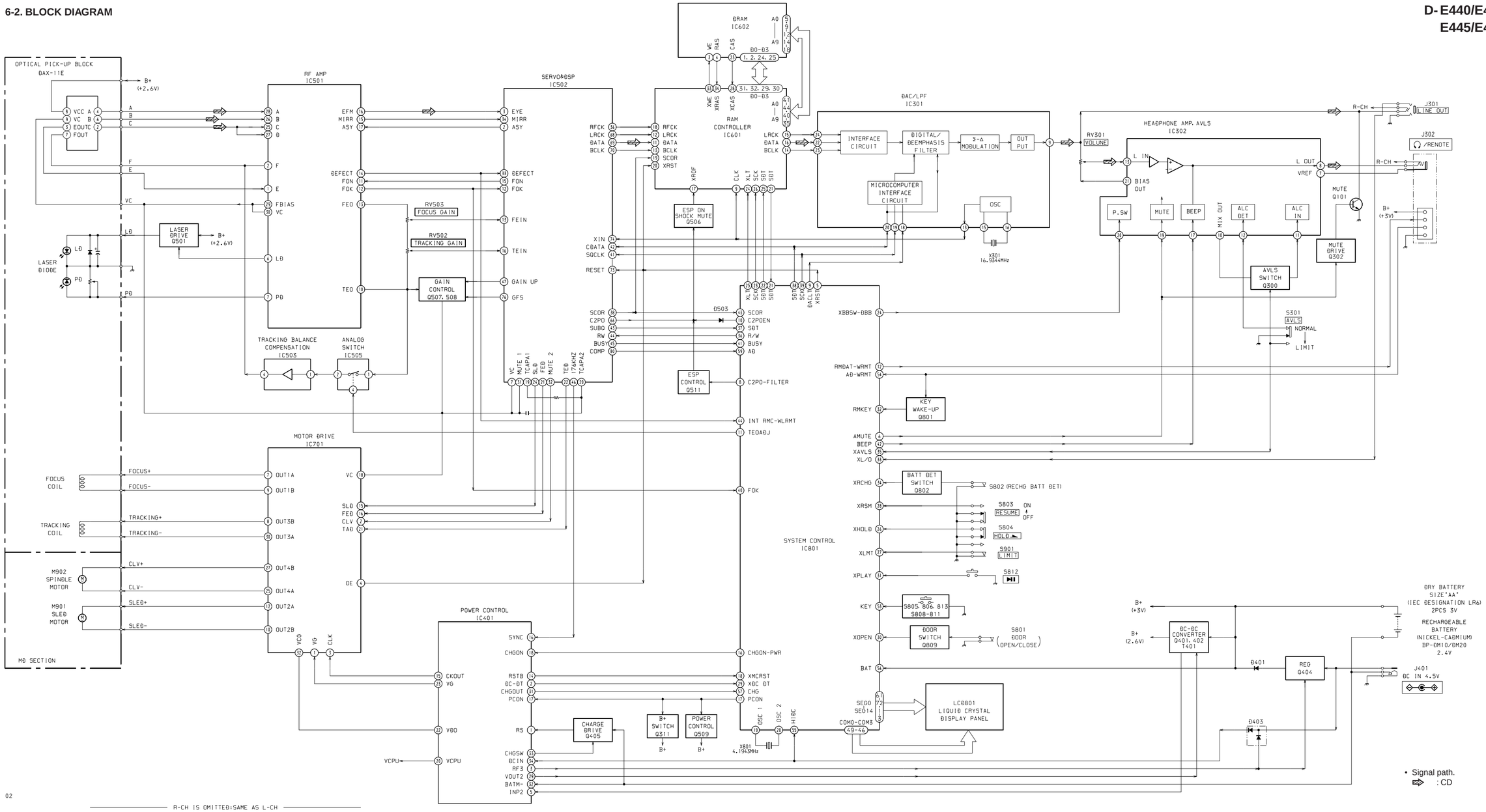
SECTION 6
DIAGRAMS

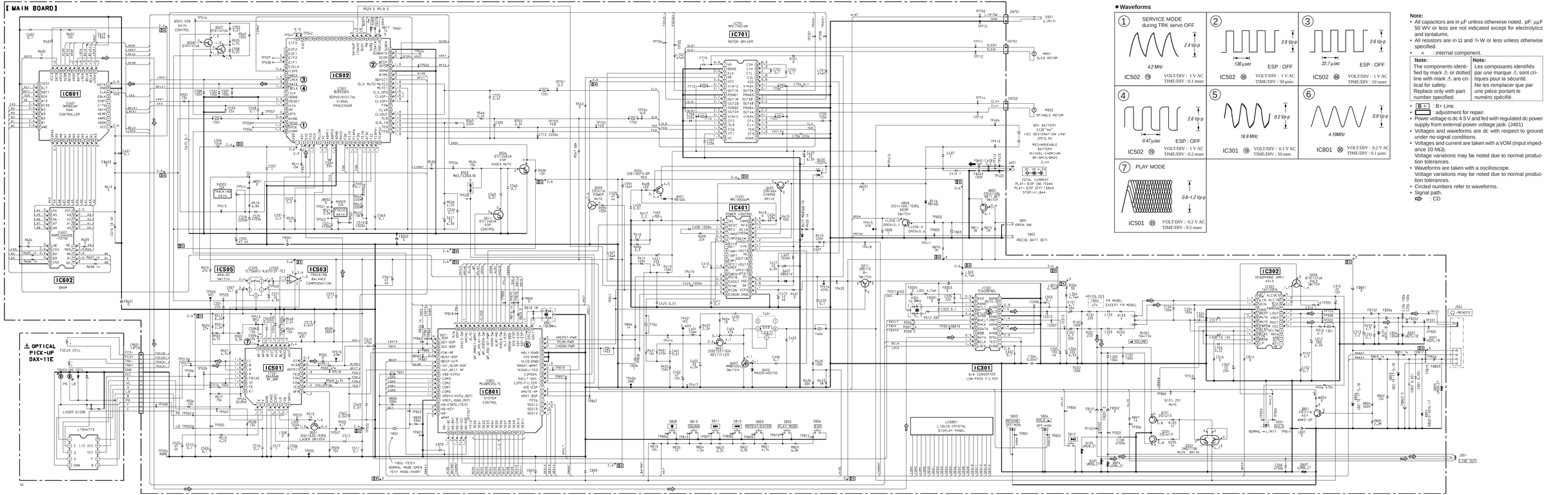
6-1. EXPLANATION OF IC TERMINALS

IC801 MC68HC05L15SC442718CPB (SYSTEM CONTROL)

Pin No.	Pin name	I/O	Description
1 – 3	SEG 12–14	O	LCD segment signal output terminal.
4	FP26	–	Not used (Open).
5	XRST– DSP	O	Reset output terminal.
6	AMUTE – HP	O	Audio mute output terminal.
7	XOE-ESP	O	ESP POWER ON control output.
8	C2PO FILTER	O	C2PO filter output.
9	DACLT–DAC	I/O	CPU serial data input, latch signal output (For DAC only).
10	C2POEN	O	C2PO signal control output. “ L ” : Stop “ H ” : Searching
11	TEOADJ – TEO	O	Tracking ADJ switch control output.
12	RMDAT–WRMT	O	Serial data output to LCD remote controller.
13	VLCD (GND)	–	Connect to ground.
14	VSS (GND)	–	Connect to ground.
15	NDLY (GND)	–	Connect to ground.
16	CHGON – PWR	O	Charge ON/OFF control output.
17	PCON–PWR	O	Power ON/OFF control output. “ L ” : ON “ H ” : OFF
18	XMCRST–PWR	I	System reset input terminal.
19	OSC 1	I	System clock oscillator input terminal (4.1943 MHz).
20	OSC 2	O	System clock oscillator output terminal (4.1943 MHz).
21	SDT–ESP	I	Serial data input from ESP control (IC601).
22	SDT–ESP	O	Serial data output to ESP control (IC601).
23	SCK–ESP	O	Serial clock output to ESP control (IC601).
24	XBBSW – DBB	O	DBB switch control output.
25	XLT–ESP	O	Latch signal output to ESP control (IC601).
26	HOLD–SW	I	Hold switch input termianl. “ L ” : HOLD ON “ H ” : HOLD OFF
27	XLMT–MD	I	Limit switch input terminal. “ L ” : Inside Track
28	XRSM–SW	I	RESUME switch input terminal. “ L ” : ON “ H ” : OFF
29	WP XDC–DT PWR	I	DC in voltage detection terminal.
30	WP XOPEN–SW	I	Door open switch input terminal. “ L ” : Close “ H ” : Open
31	WP XPLAY–SW	I	Play/pause key input terminal.
32	WP RMKEY WRMT	I	Remote control key input terminal.
33	XL/O DCT	I	LINE OUT jack detection terminal. “ L ” : Present “ H ” : No
34	XRCHG–SW	I	Rechargeable battery detection terminal. “ L ” : Present “ H ” : No
35	XAVLS–SW	I	AVLS switch input terminal.
36	R/W DSP	O	Read/Write switching signal output terminal. “ L ” : Read “ H ” : Write
37	SDT–DSP	I	SUB–Q signal input terminal.
38	SDT–DSP	O	Serial data output to DSP (IC502) and D/A C (IC301).
39	SCK–DSP	O	Clock signal to enter SUB–Q signal to DSP (IC502) and D/A C (IC301).
40	FOK–RF	I	FOK signal input terminal.
41	BUSY–DSP	I	BUSY signal input terminal from DSP (IC502).
42	BEEP–H/P	O	Beep sound output terminal.
43	INT SCOR–DSP	I	Sub code sync SO+SI input terminal.
44	INT DFCT RF	I	Wireless remote control signal input.
45	VDD (VCPU)	–	Power supply terminal.

Pin No.	Pin name	I/O	Description
46 – 49	COM 3–0	O	LCD common signal output terminal.
50	VREFH	I	Reference voltage input terminal (connect to VDD).
51	VREFL	–	Connect to ground.
52	AD ESPSL/TEST	I	Test mode terminal. “ L ” : Test mode “ H ” : Nomal mode
53	AD–KEY	I	A/D input terminal for main unit key.
54	AD–WRMT	I	A/D input terminal for remote control key.
55	AD–HI DC	I	A/D input terminal for DC IN voltage detection.
56	AD – BAT	I	Rechargeable battery/dry cell detection input.
57	AD – CHGMNT	I	A/D input terminal for charging voltage monitor.
58	AD – VCC	I	A/D input terminal for VCC voltage monitor.
59	AD – DSP OFFSET	I	A/D input terminal for DSP off-set monitor.
60	FP10	–	Not used (Open).
61 – 72	SEG 0 – 11	O	LCD segment signal output terminal.


OPTICAL PICK-UP BLOCK
ØAX-11E
B+ (+2.6V)
VCC A
VC B
EOUTC
FOUT
A
B
C
D
F
E
VC
LØ
PØ
FBIAS
VC
LASER DIODE
LASER DRIVE Q501
B+ (+2.6V)
RF AMP IC501
EFM
MIRR
ASY
ØDEFECT
FON
FOK
FEO
TEO
RV503 FOCUS GAIN
RV502 TRACKING GAIN
GAIN CONTROL Q507, 508
SERVO&DSP IC502
EYE
MIRR
ASY
ØDEFECT
FON
FOK
FEIN
TEIN
GAIN UP
GFS
RFCK
LRCK
DATA
BCLK
SCOR
XRST
XROF
CLK
XLT
SCK
SDT
SBO
XIN
CBATA
SQCLK
RESET
ESP ON SHOCK MUTE Q506
ØRAM IC602
A0
A9
WE
RAS
CAS
ØD0-ØD3
1, 2, 24, 25
31, 32, 29, 30
RAM CONTROLLER IC601
ØAC/LPF IC301
INTERFACE CIRCUIT
ØIGITAL/ ØEEMPHASIS FILTER
3-Δ MODULATION
OUT PUT
MICROCOMPUTER INTERFACE CIRCUIT
OSC
X301 16.9344MHz
HEADPHONE AMP. AVLS IC302
RV301 VOLUME
L IN
BIAS OUT
L OUT
VREF
P.SW
MUTE
BEEP
MIX OUT
ALC ØET
ALC IN
MUTE ØRIVE Q302
MUTE Q101
AVLS SWITCH Q300
S301 AVLS NORMAL LIMIT
R-CH
J301 LINE OUT
J302 ØRENOTE
B+ (+3V)
TRACKING BALANCE COMPENSATION IC503
ANALOG SWITCH IC505
ØSCR
C2PO
SUBQ
RW
BUSY
COMP
C2POEN
SØT
R/W
ØBUSY
AØ
ESP CONTROL Q511
C2PO-FILTER
INT RMC-WLRMT
TEOØJ
FOK
XBBSW-ØBB
RMØAT-WRMT
AØ-WRMT
RMKEY
KEY WAKE-UP Q801
AMUTE
BEEP
XAVLS
XL/O
XRCHG
BATT ØET SWITCH Q802
S802 (RECHG BATT ØET)
XRSM
S803 RESUME ON OFF
XHOLØ
S804 HOLØ
XLMT
S901 LIMIT
XPLAY
S812
KEY
S805, 806, 813 S808-811
XOPEN
ØOOR SWITCH Q809
S801 ØOOR (OPEN/CLOSE)
BAT
SEGØ
SEG14
COMØ-COM3
LCØ801 LIQUIØ CRYSTAL ØISPLAY PANEL
SYSTEM CONTROL IC801
MOTOR ØRIVE IC701
FOCUS+
FOCUS-
TRACKING+
TRACKING-
CLV+
CLV-
SLEØ+
SLEØ-
OUT1A
OUT1B
OUT3B
OUT3A
OUT4B
OUT4A
OUT2A
OUT2B
VC
SLØ
FEØ
CLV
TAØ
OE
FOCUS COIL
TRACKING COIL
M902 SPINØLE MOTOR
M901 SLED MOTOR
MØ SECTION
POWER CONTROL IC401
SYNC
CHGON
RSTB
ØC-ØT
CHGOUT
PCON
RS
CHØSW
ØCIN
RF3
VOUT2
BATM-
INP2
CKOUT
VG
VØØ
VCPU
CHARGE ØRIVE Q405
B+ SWITCH Q311
POWER CONTROL Q509
X801 4.1943MHz
CHGON-PWR
XMCRST
XØC ØT
CHG
PCON
ØC-ØC CONVERTER Q401, 402 T401
ØRY BATTERY SIZE "AA" (IEC ØESIGNATION LR6) 2PCS 3V
RECHARGEABLE BATTERY (NICKEL-CAØMIUM) BP-ØM10/ØM20 2.4V
ØC IN 4.5V
REG Q404
ØC IN 4.5V
Ø401
Ø403
• Signal path.
: CD
R-CH IS OMITTED:SAME AS L-CH



Note:

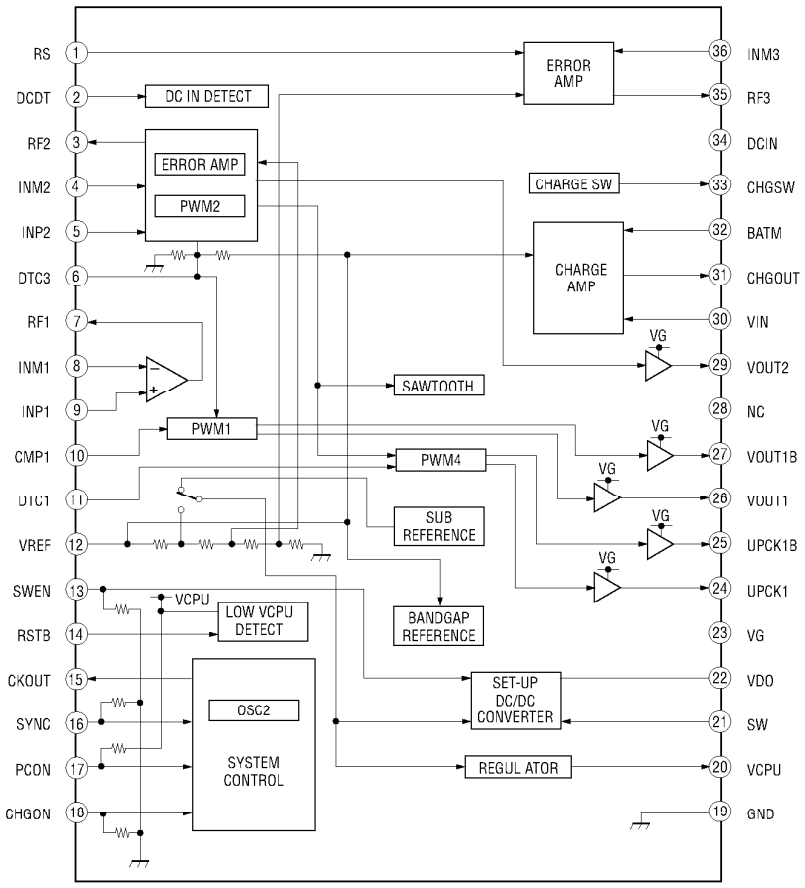
- All capacitors are in µF unless otherwise noted. pF: µµF
  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- △ : internal component.

Note:	Note:
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

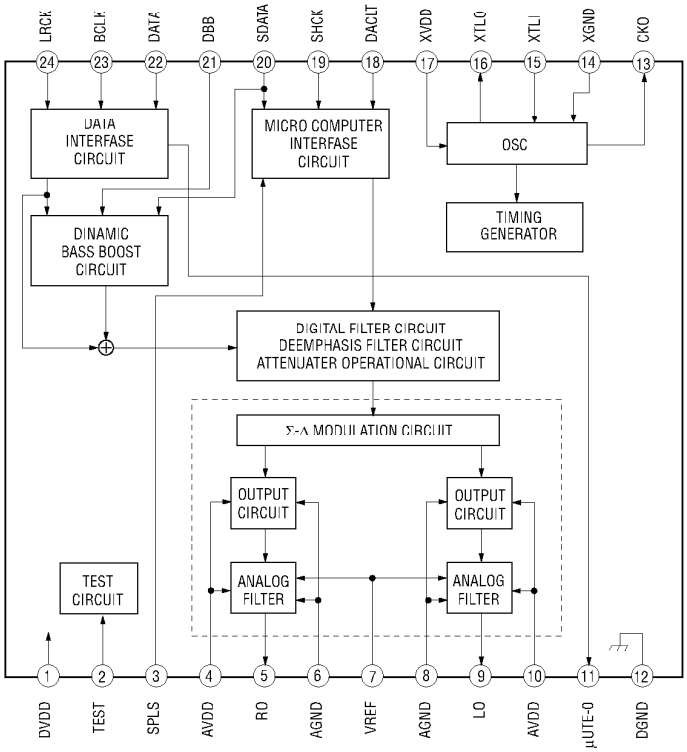
- B+ Line.
- : adjustment for repair.
- Power voltage is dc 4.5 V and fed with regulated dc power supply from external power voltage jack. (J401)
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages and current are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : CD

● **IC Block Diagrams**

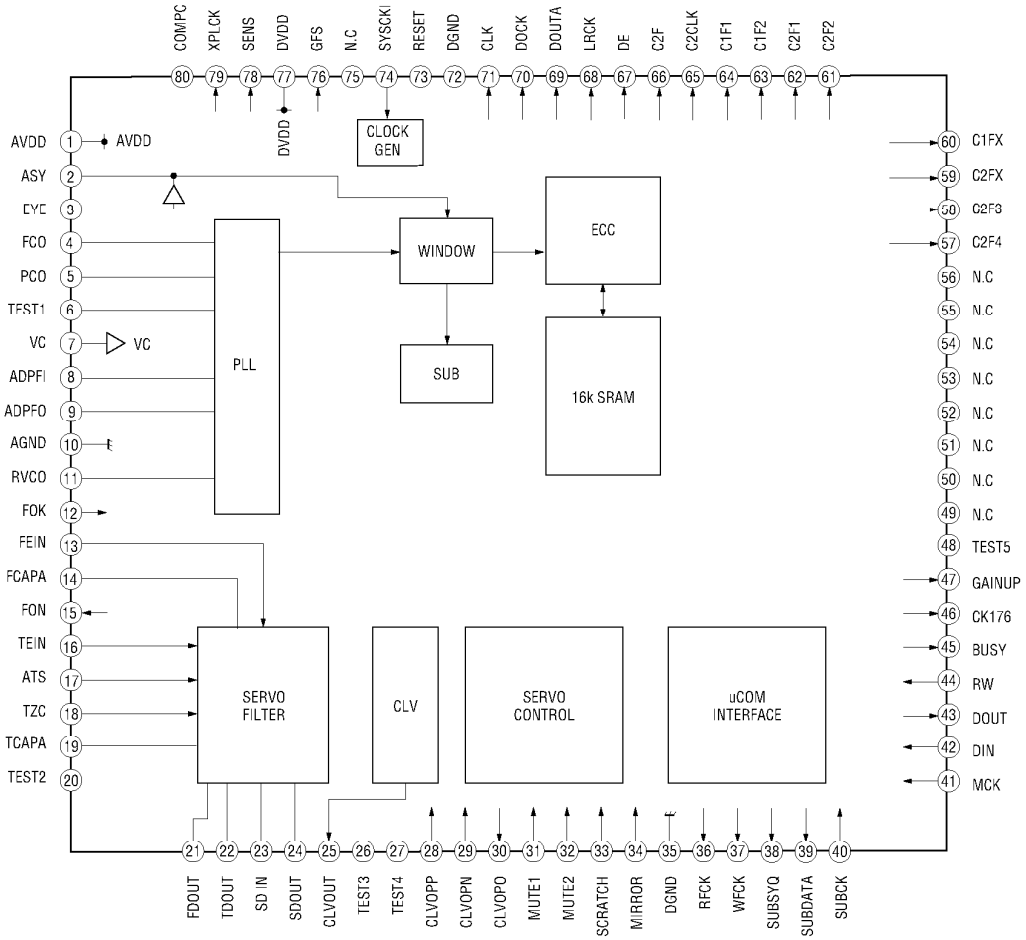
IC401 MPC18A26VMEL



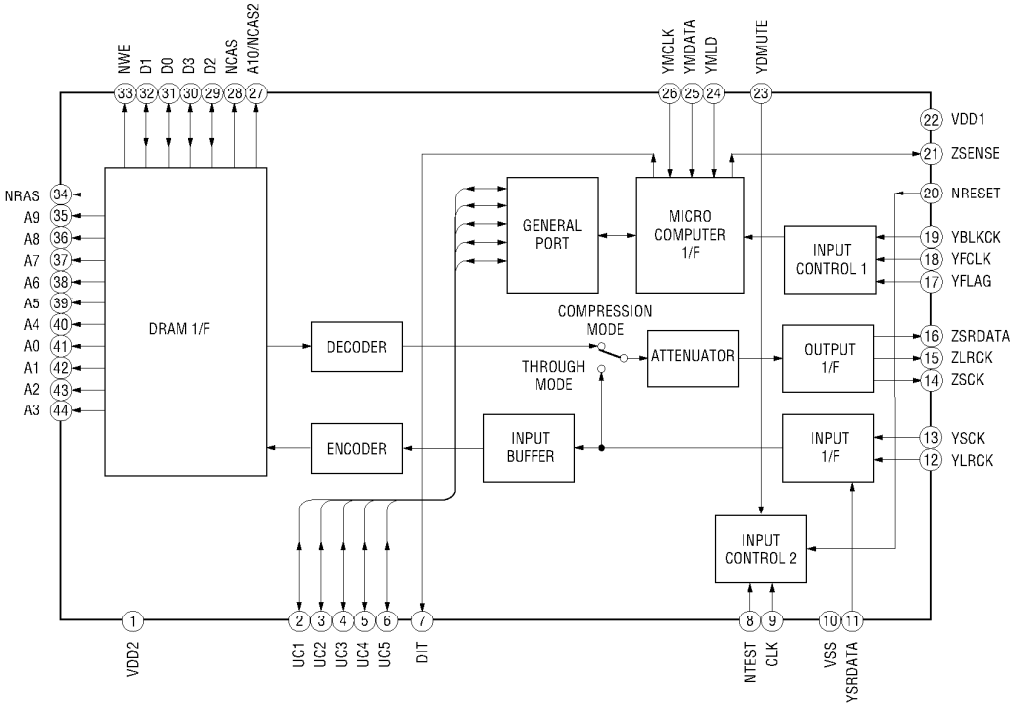
IC301 TC9438FNEL



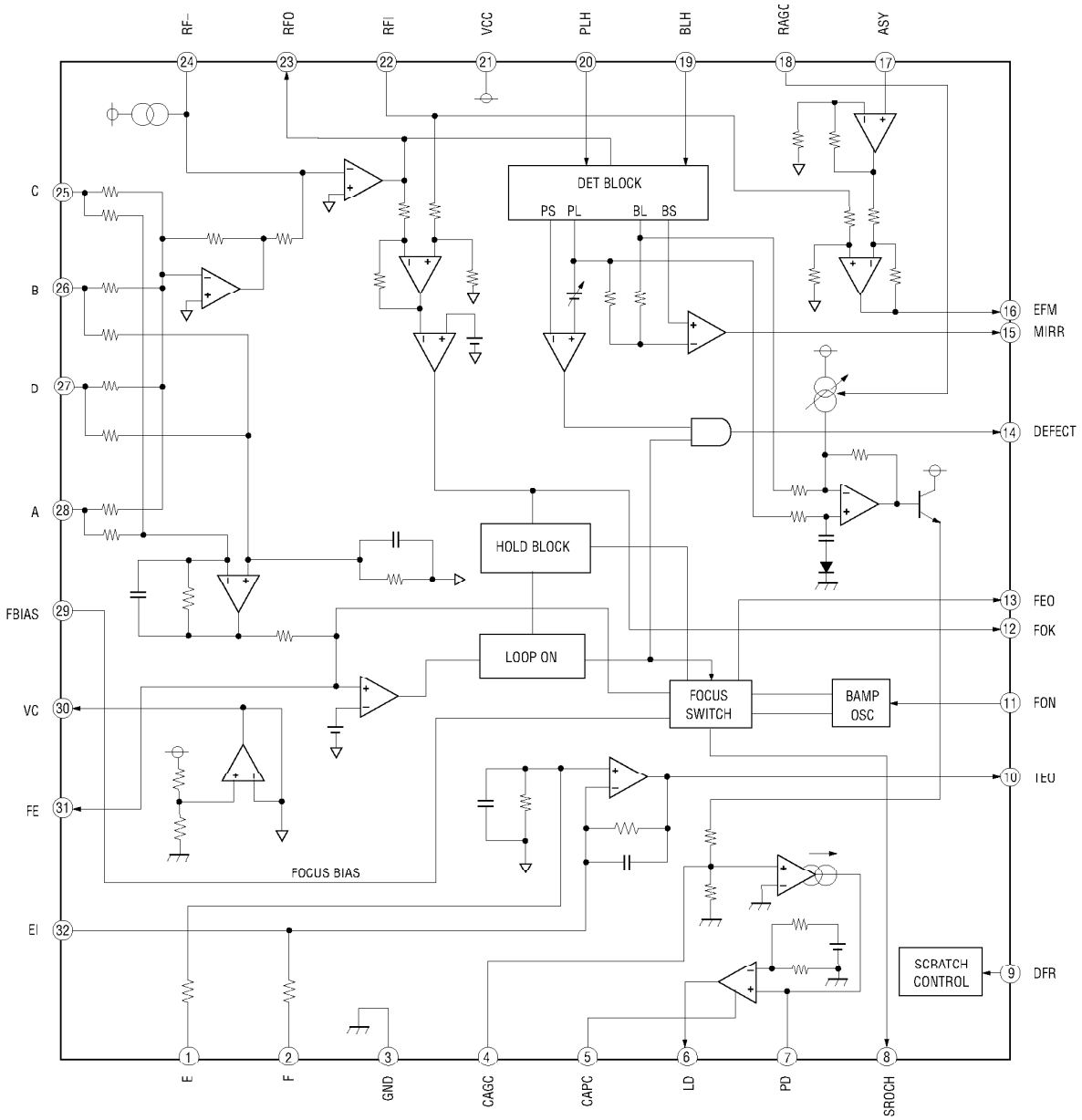
IC502 BU9326KS



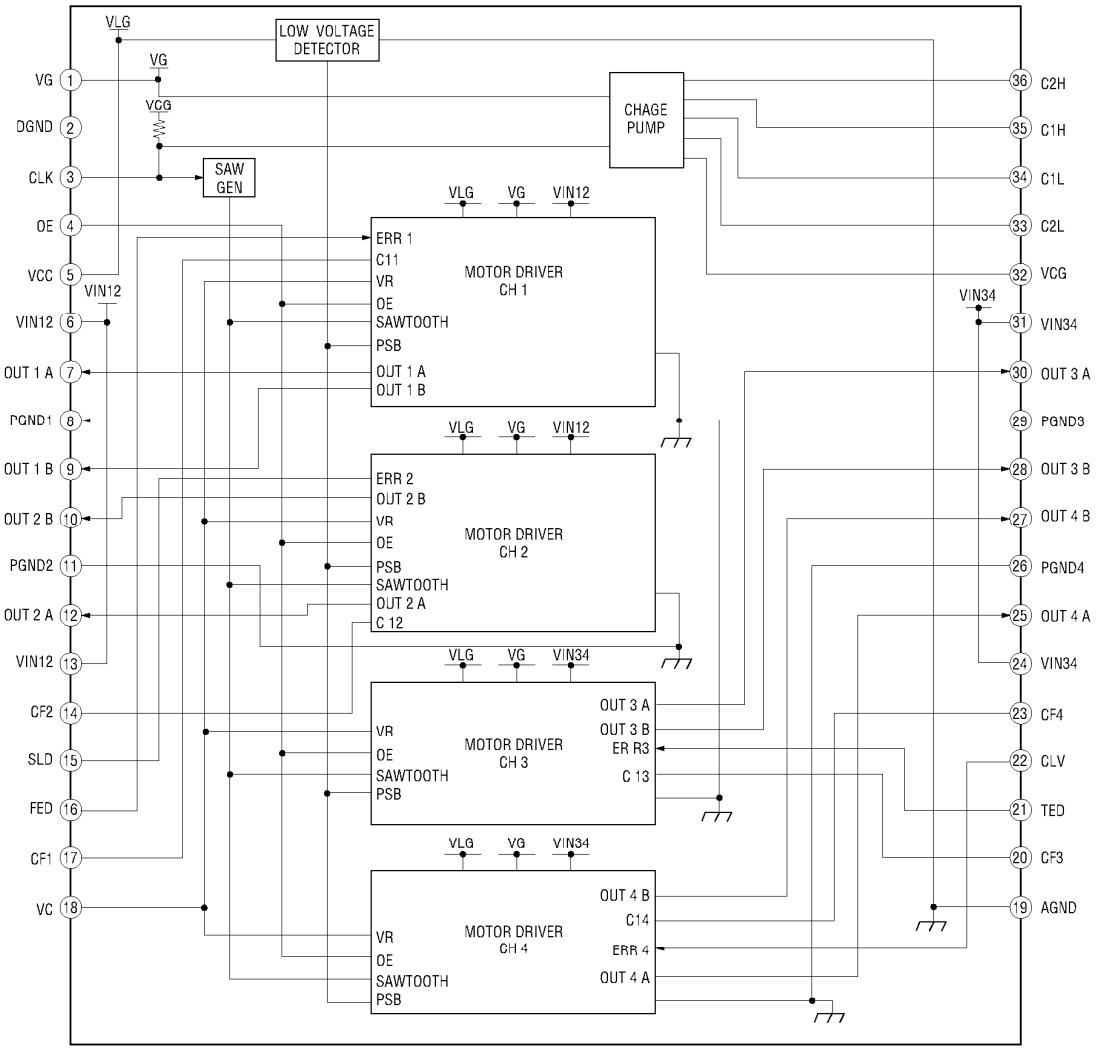
IC601 SM5902BF



IC501 BA6386K



IC701 MPC17A51VMEL



SECTION 7
EXPLODED VIEWS

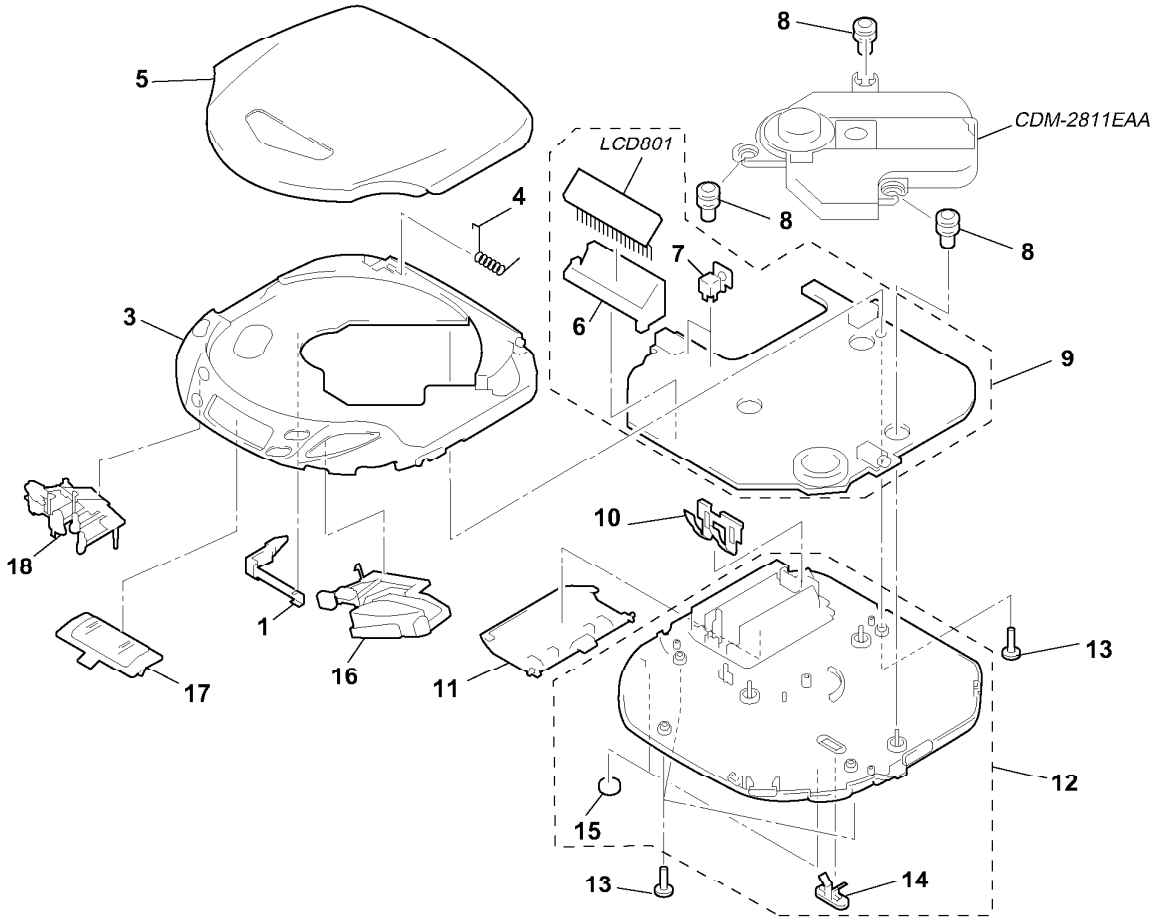
NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ••• (RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.
- Abbreviation
  FR : French
  G : German

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

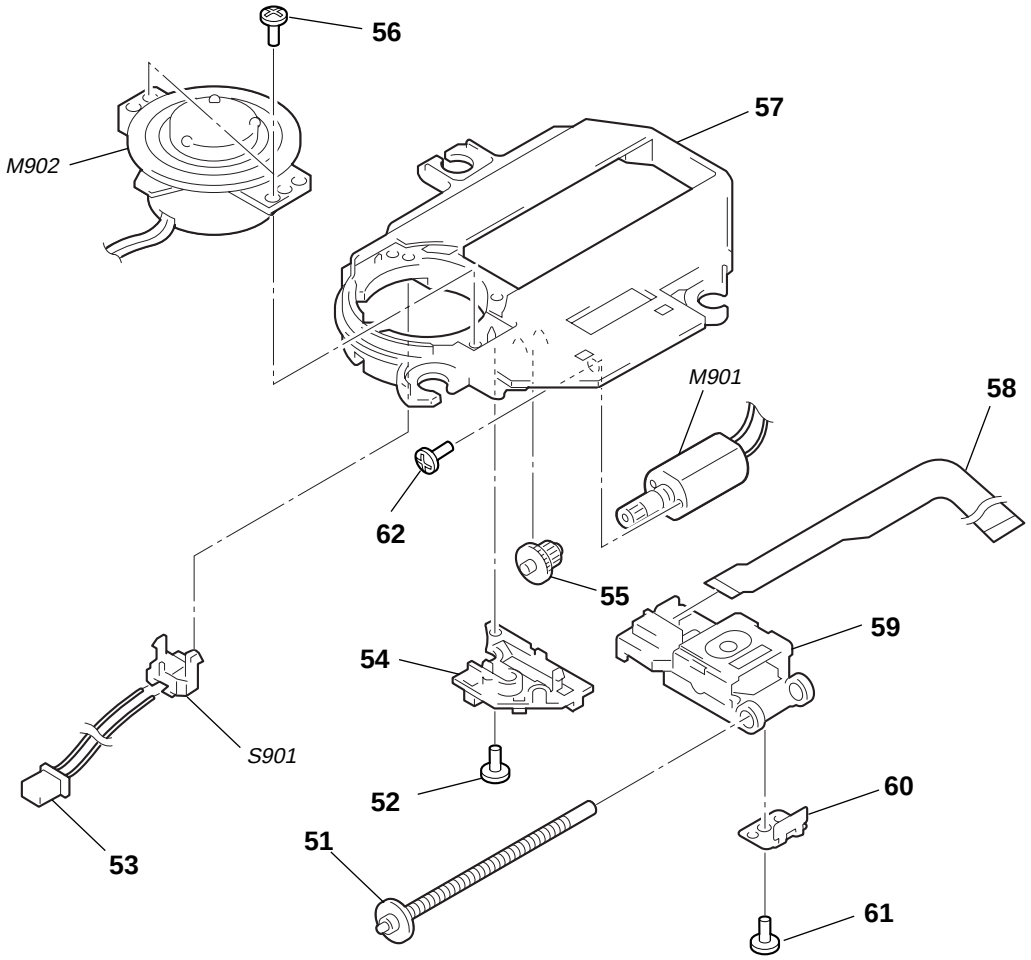
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

7-1. CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	X-4950-224-1	DETECTOR ASSY	
3	4-213-871-01	CABINET (FRONT)(BLUE)	
3	4-213-871-41	CABINET (FRONT)(SILVER)	
4	4-994-981-01	SPRING, TORSION	
5	X-4950-720-1	LID ASSY, UPPER(SILVER)(E445)	
5	X-4950-721-1	LID ASSY, UPPER(BLUE)(E445)	
5	X-4950-722-1	LID ASSY, UPPER(DARK BLUE)(E445)	
5	X-4950-723-1	LID ASSY, UPPER(E446CK)	
5	X-4950-726-1	LID ASSY, UPPER(BLUE)(E443)	
5	X-4950-731-1	LID ASSY, UPPER(SILVER)(E440)	
5	X-4950-732-1	LID ASSY, UPPER(BLUE)(E440)	
5	X-4950-733-1	LID ASSY, UPPER(SILVER)(E441)	
5	X-4950-734-1	LID ASSY, UPPER(BLUE)(E441)	
5	X-4950-735-1	LID ASSY, UPPER(ORANGE)(E441)	
5	X-4950-736-1	LID ASSY, UPPER(WHITE)(E441)	
5	X-4950-737-1	LID ASSY, UPPER(SILVER)(E443)	
5	X-4950-796-1	LID ASSY, UPPER(E449CK)	
5	X-4950-797-1	LID ASSY, UPPER(DARK BLUE)(E441)	
5	X-4950-798-1	LID ASSY, UPPER(ORANGE)(E445)	
5	X-4951-159-1	LID ASSY, UPPER(E441SR)	
6	4-213-876-01	HOLDER (LCD)	
7	4-978-695-01	PLATE,TERMINAL,BATTERY	
8	4-990-219-01	INSULATOR	
9	A-3323-101-A	MAIN BOARD,COMPLETE(FR)	
9	A-3323-102-A	MAIN BOARD,COMPLETE(EXCEPT FR)	
10	4-997-109-01	TERMINAL BOARD (RELAY),BATTERY	
11	4-213-873-01	LID,BATTERY CASE	
12	X-4950-730-1	CABINET (REAR) SUB ASSY	
13	3-336-395-01	SCREW (B2X10) (G), TAPPING	
14	4-213-879-01	KNOB(AVLS)	
15	4-966-278-01	FOOT, RUBBER	
16	4-213-875-01	BUTTON (OPR)	
17	4-213-877-01	WINDOW (LCD)	
18	4-213-874-01	BUTTON (OPEN)	
LCD801	1-803-017-11	DISPLAY PANEL, LIQUID CRYSTAL	

7-2. OPTICAL PICK-UP SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
51	A-3303-970-A	SCREW ASSY,FEED	
52	3-318-203-11	SCREW (B1.7), TAPPING	
53	1-690-530-81	LEAD(WITH CONNECTOR)	
54	4-972-163-04	SPRING, SLED	
55	4-974-003-01	GEAR(B)	
56	3-719-401-11	SCREW (B1.7), TAPPING	
* 57	4-984-320-01	CHASSIS	
58	1-660-965-11	PC BOARD, SLIDE FLEXIBLE	

Ref. No.	Part No.	Description	Remark
⚠59	X-4950-476-1	OPTICAL PICK-UP (DAX-11E RP)	
60	4-972-165-01	RACK	
61	4-973-631-01	SCREW	
62	7-627-850-17	SCREW,PRECISION +P 1.4X2.5	
M901	A-3303-403-A	MOTOR ASSY, SLED (SLED)	(INCLUDING GEAR)
M902	A-3304-989-A	MOTOR ASSY,TURNTABLE (SPINDLE)	
S901	1-571-099-21	SWITCH (1 KEY)(LIMIT)	

SECTION 8
ELECTRICAL PARTS LIST

MAIN

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : µ , for example :
  uA.... : µ A.... , uPA.... : µ PA....
  uPB.... : µ PB.... , uPC.... : µ PC....
  uPD.... : µ PD....
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H
- Abbreviation

AR	: Argentine	G	: German
AUS	: Australian	CND	: Canadian
FR	: French	HK	: Hong Kong
EA	: Saudi Arabia	CN	: Chinese
EE	: East European		
AEP	: Manual of English is attached		
7AEP	: Manual of 9 language is attached		
C&SA	: Central and South America		
E13	: AC220-230V area model		
E33	: AC100-240V area model		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3323-101-A	MAIN BOARD,COMPLETE (FR)			
		**********			
	A-3323-102-A	MAIN BOARD,COMPLETE (EXCEPT FR)			
		**********			
	4-213-876-01	HOLDER(LCD)			
	4-978-695-01	PLATE,TERMINAL, BATTERY			
		< CAPACITOR >			
C101	1-126-794-11	ELECT	4.7uF	20%	50V
C102	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C103	1-115-156-11	CERAMIC CHIP	1uF		10V
C104	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C105	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C106	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C108	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C201	1-126-794-11	ELECT	4.7uF	20%	50V
C202	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C203	1-115-156-11	CERAMIC CHIP	1uF		10V
C204	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C205	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C206	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C208	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C302	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C303	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C304	1-124-635-00	ELECT	220uF	20%	6.3V
C305	1-124-584-00	ELECT	100uF	20%	10V
C306	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C307	1-126-795-11	ELECT	10uF	20%	25V
C308	1-126-795-11	ELECT	10uF	20%	25V
C312	1-128-057-11	ELECT	330uF	20%	6.3V
C313	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C314	1-115-156-11	CERAMIC CHIP	1uF		10V
C315	1-126-514-11	ELECT	22uF	20%	10V
C316	1-216-864-11	METAL CHIP	0	5%	1/16W
C317	1-115-156-11	CERAMIC CHIP	1uF		10V
C323	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C324	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C326	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V

Ref. No.	Part No.	Description			Remark
C335	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C401	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C402	1-126-785-11	ELECT	47uF	20%	10V
C403	1-127-485-00	ELECT	33uF	20%	6.3V
C404	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C405	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C406	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C407	1-115-156-11	CERAMIC CHIP	1uF		10V
C408	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C410	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C411	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C414	1-115-156-11	CERAMIC CHIP	1uF		10V
C415	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C417	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C420	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C421	1-124-635-00	ELECT	220uF	20%	6.3V
C424	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C425	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C426	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C427	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C428	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C432	1-115-156-11	CERAMIC CHIP	1uF		10V
C437	1-115-156-11	CERAMIC CHIP	1uF		10V
C439	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C501	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C503	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C504	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C505	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C506	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C509	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C510	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C511	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C512	1-115-156-11	CERAMIC CHIP	1uF		10V
C513	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C514	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C515	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C516	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C517	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C518	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C519	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V

MAIN

Ref. No.	Part No.	Description			Remark
C520	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C521	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C523	1-115-565-11	CERAMIC CHIP	2.2uF	10%	10V
C525	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C526	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C528	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C529	1-126-513-11	ELECT	47uF	20%	4V
C531	1-115-565-11	CERAMIC CHIP	2.2uF	10%	10V
C532	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C534	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C535	1-115-156-11	CERAMIC CHIP	1uF		10V
C538	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C539	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C540	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C549	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C550	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C555	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C557	1-115-156-11	CERAMIC CHIP	1uF		10V
C560	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C561	1-126-513-11	ELECT	47uF	20%	4V
C562	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C563	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C565	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C571	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C572	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C575	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C587	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C588	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C598	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C599	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C601	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C602	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C611	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C615	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C616	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C619	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C702	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C703	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C704	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C705	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C706	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C707	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C708	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C712	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C716	1-164-346-11	CERAMIC CHIP	1uF		16V
C801	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C802	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C804	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C806	1-115-156-11	CERAMIC CHIP	1uF		10V
C807	1-115-156-11	CERAMIC CHIP	1uF		10V
C808	1-115-156-11	CERAMIC CHIP	1uF		10V
C809	1-115-156-11	CERAMIC CHIP	1uF		10V
C814	1-216-864-11	METAL CHIP	0	5%	1/16W
C879	1-115-156-11	CERAMIC CHIP	1uF		10V
C907	1-164-360-11	CERAMIC CHIP	0.1uF		16V
		< CONNECTOR >			
CN501	1-566-530-11	CONNECTOR, FPC (ZIF) 14P			
CN701	1-695-320-51	PIN, CONNECTOR (1.5MM)(SMD) 2P			
CN702	1-695-320-31	PIN, CONNECTOR (1.5MM)(SMD) 2P			
CN703	1-695-320-21	PIN, CONNECTOR (1.5MM)(SMD) 2P			
		< DIODE >			
D101	8-719-069-54	DIODE UDZS-TE17-5.1B			
D105	8-719-039-99	DIODE UMZ8.2T			
D201	8-719-069-54	DIODE UDZS-TE17-5.1B			
D205	8-719-039-99	DIODE UMZ8.2T			
D302	8-719-069-54	DIODE UDZS-TE17-5.1B			
D401	8-719-048-98	DIODE RB160L-40TE25			
D402	8-719-072-70	DIODE MA2ZD14001S0			
D403	8-719-049-10	DIODE 1SS374-TE85L			
D407	8-719-058-24	DIODE RB501V-40TE-17			
D416	8-719-048-98	DIODE RB160L-40TE25			
D417	8-719-017-58	DIODE MA8068			
D503	8-719-059-50	DIODE MA3J142D0LSO			
D801	8-719-058-24	DIODE RB501V-40TE-17			
D803	8-719-069-54	DIODE UDZS-TE17-5.1B			
D804	8-719-039-99	DIODE UMZ8.2T			
D805	8-719-039-99	DIODE UMZ8.2T			
D806	8-719-069-54	DIODE UDZS-TE17-5.1B			
D807	8-719-039-99	DIODE UMZ8.2T			
		< FERRITE BEAD >			
FB101	1-414-595-11	INDUCTOR CHIP			
FB102	1-414-595-11	INDUCTOR CHIP			
FB201	1-414-595-11	INDUCTOR CHIP			
FB202	1-414-595-11	INDUCTOR CHIP			
FB301	1-414-595-11	INDUCTOR CHIP			
FB302	1-414-595-11	INDUCTOR CHIP			
FB303	1-216-295-00	METAL CHIP	0	5%	1/10W
FB304	1-414-595-11	INDUCTOR CHIP			
FB306	1-414-595-11	INDUCTOR CHIP			
FB401	1-412-026-11	INDUCTOR CHIP	1uH		
FB402	1-414-398-11	INDUCTOR	10uH		
FB501	1-414-595-11	INDUCTOR CHIP			
FB502	1-414-595-11	INDUCTOR CHIP			
FB601	1-414-595-11	INDUCTOR CHIP			
FB603	1-216-295-00	METAL CHIP	0	5%	1/10W
FB801	1-414-595-11	INDUCTOR CHIP			
FB802	1-216-864-11	METAL CHIP	0	5%	1/16W
FB803	1-414-595-11	INDUCTOR CHIP			
		< IC >			
IC301	8-759-483-60	IC TC9438FNEL			
IC302	8-759-522-87	IC TA2120FN(EL)			
IC401	8-759-483-61	IC MPC18A26VMEL			
IC501	8-759-432-83	IC BA6386K			
IC502	8-759-563-54	IC BU9326KS			
IC503	8-759-528-79	IC NJU7012F-TE2			
IC505	8-759-082-60	IC TC7S66FU			
IC601	8-759-581-80	IC SM5902BF			
IC602	8-759-498-44	IC MSM51V4400D-70TSK			
IC701	8-759-483-62	IC MPC17A51VMEL			
IC801	8-759-575-14	IC MC68HC05L15SC442718CPB			

Ref. No.	Part No.	Description			Remark
		< JACK >			
J301	1-778-696-11	JACK(LINE OUT)			
J302	1-580-680-11	JACK(🎧/REMOTE)			
J401	1-778-153-21	JACK,DC(POLARITY UNIFIED TYPE)			(DC IN 4.5V)
		< JUMPER RESISTOR >			
JW304	1-216-864-11	METAL CHIP	0	5%	1/16W
JW401	1-216-296-00	METAL CHIP	0	5%	1/10W
JW501	1-216-295-00	METAL CHIP	0	5%	1/10W
JW502	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L301	1-469-034-11	INDUCTOR	4.7uH		
L302	1-414-821-11	INDUCTOR	4.7uH		
L303	1-414-821-11	INDUCTOR	4.7uH		
L304	1-414-821-11	INDUCTOR	4.7uH		
L401	1-414-267-11	INDUCTOR	10uH		
L402	1-414-404-11	INDUCTOR	100uH		
L402	1-414-404-11	INDUCTOR	100uH		
L502	1-414-267-11	INDUCTOR	10uH		
L504	1-414-267-11	INDUCTOR	10uH		
L506	1-414-267-11	INDUCTOR	10uH		
L507	1-414-267-11	INDUCTOR	10uH		
L508	1-216-295-00	METAL CHIP	0	5%	1/10W
L701	1-414-402-11	INDUCTOR	47uH		
L702	1-414-402-11	INDUCTOR	47uH		
L801	1-414-916-11	FERRITE			
		< LIQUID CRYSTAL DISPLAY >			
LCD801	1-803-017-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q101	8-729-209-06	TRANSISTOR	2SC4213-A		
Q201	8-729-209-06	TRANSISTOR	2SC4213-A		
Q300	8-729-028-74	TRANSISTOR	DTA114TUA-T106		
Q302	8-729-907-39	TRANSISTOR	IMD2		
Q311	8-729-422-51	TRANSISTOR	UN5110-QRS		
Q401	8-729-044-09	TRANSISTOR	2SD2153T100V		
Q402	8-729-044-10	TRANSISTOR	MMBF0201NLT1		
Q404	8-729-921-93	TRANSISTOR	2SB1182F5-QR		
Q405	8-729-920-85	TRANSISTOR	2SD1664-QR		
Q501	8-729-216-22	TRANSISTOR	2SA1162-G		
Q506	8-729-029-06	TRANSISTOR	DTC124EUA-T106		
Q507	8-729-028-74	TRANSISTOR	DTA114TUA-T106		
Q508	8-729-028-74	TRANSISTOR	DTA114TUA-T106		
Q509	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q511	8-729-029-06	TRANSISTOR	DTC124EUA-T106		
Q801	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q802	8-729-231-74	TRANSISTOR	2SC4116-GL		
Q809	8-729-231-74	TRANSISTOR	2SC4116-GL		
		< RESISTOR >			
R101	1-216-813-11	METAL CHIP	220	5%	1/16W
R102	1-216-845-11	METAL CHIP	100K	5%	1/16W
R103	1-216-841-11	METAL CHIP	47K	5%	1/16W (EXCEPT FR)

Ref. No.	Part No.	Description			Remark
R103	1-218-901-11	RES,CHIP	180K	0.50%	1/16W (FR)
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W
R107	1-216-793-11	RES,CHIP	4.7	5%	1/16W
R201	1-216-813-11	METAL CHIP	220	5%	1/16W
R202	1-216-845-11	METAL CHIP	100K	5%	1/16W
R203	1-216-841-11	METAL CHIP	47K	5%	1/16W (EXCEPT FR)
R203	1-218-901-11	RES,CHIP	180K	0.50%	1/16W (FR)
R205	1-216-821-11	METAL CHIP	1K	5%	1/16W
R207	1-216-793-11	RES,CHIP	4.7	5%	1/16W
R304	1-216-803-11	METAL CHIP	33	5%	1/16W
R306	1-216-864-11	METAL CHIP	0	5%	1/16W
R307	1-216-821-11	METAL CHIP	1K	5%	1/16W
R308	1-216-864-11	METAL CHIP	0	5%	1/16W
R310	1-216-142-00	RES,CHIP	4.7	5%	1/8W
R312	1-216-815-11	METAL CHIP	330	5%	1/16W
R326	1-216-853-11	METAL CHIP	470K	5%	1/16W
R401	1-218-911-11	RES,CHIP	470K	0.50%	1/16W
R402	1-218-899-11	RES,CHIP	150K	0.50%	1/16W
R403	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R404	1-216-799-11	METAL CHIP	15	5%	1/16W
R406	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R408	1-216-809-11	METAL CHIP	100	5%	1/16W
R409	1-216-837-11	METAL CHIP	22K	5%	1/16W
R413	1-216-845-11	METAL CHIP	100K	5%	1/16W
R414	1-216-845-11	METAL CHIP	100K	5%	1/16W
R415	1-216-815-11	METAL CHIP	330	5%	1/16W
R416	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R417	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R418	1-216-864-11	METAL CHIP	0	5%	1/16W
R419	1-216-849-11	METAL CHIP	220K	5%	1/16W
R421	1-216-833-11	METAL CHIP	10K	5%	1/16W
R423	1-216-857-11	METAL CHIP	1M	5%	1/16W
R429	1-218-895-11	RES,CHIP	100K	0.50%	1/16W
R430	1-218-883-11	RES,CHIP	33K	0.50%	1/16W
R431	1-216-864-11	METAL CHIP	0	5%	1/16W
R433	1-216-821-11	METAL CHIP	1K	5%	1/16W
R501	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R502	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R503	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R504	1-216-839-11	METAL CHIP	33K	5%	1/16W
R505	1-216-142-00	RES,CHIP	4.7	5%	1/8W
R506	1-216-833-11	METAL CHIP	10K	5%	1/16W
R507	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W
R509	1-216-835-11	METAL CHIP	15K	5%	1/16W
R510	1-216-821-11	METAL CHIP	1K	5%	1/16W
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W
R512	1-216-833-11	METAL CHIP	10K	5%	1/16W
R513	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R517	1-216-835-11	METAL CHIP	15K	5%	1/16W
R518	1-216-864-11	METAL CHIP	0	5%	1/16W
R519	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R521	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-821-11	METAL CHIP	1K	5%	1/16W

MAIN

Ref. No.	Part No.	Description			Remark
R528	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R529	1-216-864-11	METAL CHIP	0	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-841-11	METAL CHIP	47K	5%	1/16W
R534	1-216-833-11	METAL CHIP	10K	5%	1/16W
R535	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W
R539	1-216-864-11	METAL CHIP	0	5%	1/16W
R542	1-216-851-11	METAL CHIP	330K	5%	1/16W
R543	1-216-864-11	METAL CHIP	0	5%	1/16W
R544	1-216-849-11	METAL CHIP	220K	5%	1/16W
R545	1-216-849-11	METAL CHIP	220K	5%	1/16W
R546	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R547	1-216-843-11	METAL CHIP	68K	5%	1/16W
R548	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R549	1-216-833-11	METAL CHIP	10K	5%	1/16W
R550	1-216-864-11	METAL CHIP	0	5%	1/16W
R555	1-216-845-11	METAL CHIP	100K	5%	1/16W
R563	1-216-845-11	METAL CHIP	100K	5%	1/16W
R569	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R570	1-216-841-11	METAL CHIP	47K	5%	1/16W
R599	1-216-851-11	METAL CHIP	330K	5%	1/16W
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W
R604	1-216-864-11	METAL CHIP	0	5%	1/16W
R605	1-216-821-11	METAL CHIP	1K	5%	1/16W
R606	1-216-821-11	METAL CHIP	1K	5%	1/16W
R607	1-216-821-11	METAL CHIP	1K	5%	1/16W
R608	1-216-821-11	METAL CHIP	1K	5%	1/16W
R609	1-216-864-11	METAL CHIP	0	5%	1/16W
R610	1-216-864-11	METAL CHIP	0	5%	1/16W
R630	1-216-864-11	METAL CHIP	0	5%	1/16W
R632	1-216-864-11	METAL CHIP	0	5%	1/16W
R701	1-216-864-11	METAL CHIP	0	5%	1/16W
R702	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R801	1-216-821-11	METAL CHIP	1K	5%	1/16W
R802	1-216-833-11	METAL CHIP	10K	5%	1/16W
R803	1-216-821-11	METAL CHIP	1K	5%	1/16W
R804	1-216-854-11	METAL CHIP	560K	5%	1/16W
R805	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R806	1-216-821-11	METAL CHIP	1K	5%	1/16W
R807	1-216-821-11	METAL CHIP	1K	5%	1/16W
R808	1-216-851-11	METAL CHIP	330K	5%	1/16W
R809	1-216-851-11	METAL CHIP	330K	5%	1/16W
R810	1-216-857-11	METAL CHIP	1M	5%	1/16W
R811	1-216-857-11	METAL CHIP	1M	5%	1/16W
R813	1-216-833-11	METAL CHIP	10K	5%	1/16W
R817	1-216-821-11	METAL CHIP	1K	5%	1/16W
R818	1-216-857-11	METAL CHIP	1M	5%	1/16W
R819	1-216-821-11	METAL CHIP	1K	5%	1/16W
R820	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R821	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R822	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R823	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R824	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R825	1-216-821-11	METAL CHIP	1K	5%	1/16W
R826	1-216-821-11	METAL CHIP	1K	5%	1/16W
R829	1-216-864-11	METAL CHIP	0	5%	1/16W
R830	1-216-864-11	METAL CHIP	0	5%	1/16W
R879	1-216-857-11	METAL CHIP	1M	5%	1/16W

Ref. No.	Part No.	Description
		< VARIABLE RESISTOR >
RV301	1-223-609-21	RES, VAR, CARBON 10K/10K(◢VOLUME)
RV502	1-223-587-11	RES, ADJ, CARBON 22K(TRACKING GAIN)
RV503	1-223-587-11	RES, ADJ, CARBON 22K(FOCUS GAIN)
		< SWITCH >
S301	1-762-078-11	SWITCH, SLIDE(AVLS)
S801	1-762-822-11	SWITCH, PUSH (1 KEY)(OPEN SW)
S802	1-571-754-31	SWITCH, PUSH (1 KEY)(RECHG BAT DET)
S803	1-762-078-11	SWITCH, SLIDE(RESUME)
S804	1-762-078-11	SWITCH, SLIDE(HOLD ▬◣)
S805	1-572-199-11	SWITCH, KEYBOARD(PLAY MODE)
S806	1-572-199-11	SWITCH, KEYBOARD(ESP)
S808	1-572-199-11	SWITCH, KEYBOARD(■)
S809	1-572-199-11	SWITCH, KEYBOARD(REPEAT/ENTER)
S810	1-572-199-11	SWITCH, KEYBOARD(I◀◀)
S811	1-572-199-11	SWITCH, KEYBOARD(▶▶I)
S812	1-572-199-11	SWITCH, KEYBOARD(▶II)
S813	1-554-088-00	SWITCH, KEY BOARD(SOUND)
		< TRANSFORMER >
T401	1-475-573-11	TRANSFORMER, DC-DC CONVERTER
		< VIBRATOR >
X301	1-760-307-11	VIBRATOR, CERAMIC(16.9MHz)
X801	1-577-101-11	VIBRATOR, CERAMIC(4.1943MHz)
**********		**********
		MISCELLANEOUS
		**********
53	1-690-530-81	LEAD(WITH CONNECTOR)
58	1-660-965-11	PC BOARD, SLIDE FLEXIBLE
⚠59	X-4950-476-1	OPTICAL PICK-UP (DAX-11E RP)
LCD801	1-803-017-11	DISPLAY PANEL, LIQUID CRYSTAL
M901	A-3303-403-A	MOTOR ASSY, SLED (SLED) (INCLUDING GEAR)
M902	A-3304-989-A	MOTOR ASSY,TURNTABLE (SPINDLE)
S901	1-571-099-21	SWITCH (1 KEY)(LIMIT)
**********		**********
		ACCESSORIES & PACKING MATERIALS
		**********
	1-251-696-11	CONNECTING PACK, CAR(E446CK/E449CK)
⚠	1-467-007-22	ADAPTOR, AC (AC-E455)(AUS)
⚠	1-467-012-11	ADAPTOR, AC (AC-E455)(EA)
⚠	1-467-195-11	ADAPTOR, AC (AC-E455A)(US/CND/C&SA)
⚠	1-467-550-11	ADAPTOR, AC (AC-E455A)(E33)
⚠	1-473-115-11	ADAPTOR, AC (AC-E455D)(UK)
⚠	1-473-116-35	ADAPTOR, AC (AC-E455D)(AEP/E13/EE/FR/G)
	1-475-603-11	REMOTE CONTROL UNIT(RM-DM29) (E445/E449CK)
⚠	1-475-622-12	ADAPTOR, AC (AC-E455)(CN)
⚠	1-475-623-11	ADAPTOR, AC (AC-E455)(HK)
⚠	1-475-969-11	ADAPTOR, AC (AC-E455)(AR)

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Ref. No.	Part No.	Description	Remark
	1-528-444-11	BATTERY PACK (BP-DM10) (E443:E13,E33,EA/E445:AUS,CND,CN,E13,EE,HK)	
	1-528-444-31	BATTERY PACK (BP-DM10)(E445:US/E449CK)	
	1-528-444-81	BATTERY PACK (BP-DM10)(E443:AEP,FR,G,UK/E445:AEP,FR,G,UK)	
⚠	1-532-452-99	FUSE,GLASS CYLINDRICAL(DIA.5)1A 125V (E446CK/E449CK)	
⚠	1-569-007-11	ADAPTOR, CONVERSION 2P(E33)	
⚠	1-569-008-21	ADAPTOR, CONVERSION 2P(E13/EA)	
	1-784-619-11	CORD DCC-E2455//M SET(E446CK/E449CK)	
	3-856-479-11	MANUAL, INSTRUCTION(SPANISH) (FOR CAR KIT) (E446CK:AR,AEP,E33,C&SA)	
	3-856-479-21	MANUAL, INSTRUCTION(ENGLISH) (FOR CAR KIT) (E446CK:AR,AEP,AUS,CND,E33,C&SA,EA,EE,FR,UK,US/E449CK)	
	3-856-479-31	MANUAL, INSTRUCTION(FRENCH) (FOR CAR KIT) (E446CK:AEP,CND,FR)	
	3-856-479-41	MANUAL, INSTRUCTION(DUTCH) (FOR CAR KIT) (E446CK:AEP,EE)	
	3-856-479-51	MANUAL, INSTRUCTION(SWEDISH) (FOR CAR KIT) (E446CK:AEP)	
	3-856-479-61	MANUAL, INSTRUCTION(PORTUGUESE) (FOR CAR KIT) (E446CK:AR,AEP,C&SA)	
	3-856-479-71	MANUAL, INSTRUCTION(GERMAN) (FOR CAR KIT) (E446CK:AEP,G)	
	3-856-479-81	MANUAL, INSTRUCTION(ITALIAN) (FOR CAR KIT) (E446CK:AEP)	
	3-856-479-91	MANUAL, INSTRUCTION(FINNISH) (FOR CAR KIT) (E446CK:AEP)	
	3-859-336-11	MANUAL, INSTRUCTION(TRADITIONAL CHINESE) (FOR CAR KIT)(E446CK:E13)	
	3-859-336-21	MANUAL, INSTRUCTION(ENGLISH) (FOR CAR KIT) (E446CK:E13)	
	3-859-401-21	MANUAL, INSTRUCTION (ENGLISH,FRENCH,GERMAN,DUTCH,SPANISH,ITALIAN,PORTUGUESE,SWEDISH) (FOR SPEAKER SYSTEM) (E441SR:AEP,EE,FR,G,UK)	
	3-865-543-11	MANUAL, INSTRUCTION(SPANISH) (E440:7AEP/E441:AEP,AR,E33,C&SA/E441SR:AEP/E443:AEP,E33/E445:AEP/E446CK:AR,AEP,E33,C&SA)	
	3-865-543-21	MANUAL, INSTRUCTION(ENGLISH)(E440:AEP,7AEP,FR/E441:AEP,7AEP,AR,AUS,CND,E33,C&SA,EA,EE,FR,UK,US/E441SR:AEP,EE,FR,UK/E443:AEP,E33,EA,FR,UK/E445:AEP,AUS,CND,EE,FR,UK,US/E446CK:AR,AEP,AUS,CND,E33,C&SA,EA,EE,FR,UK,US/E449CK)	
	3-865-543-31	MANUAL, INSTRUCTION(FRENCH)(E440:7AEP,FR/E441:AEP,CND,FR/E441SR:AEP,FR/E443:AEP,FR/E445:AEP,CND,FR/E446CK:AEP,CND,FR)	
	3-865-543-41	MANUAL, INSTRUCTION(DUTCH)(E440:7AEP/E441:AEP,EE/E441SR:AEP,EE/E443:AEP/E445:AEP,EE/E446CK:AEP,EE)	
	3-865-543-51	MANUAL, INSTRUCTION(SWEDISH)(E440:7AEP/E441:AEP/E441SR:AEP/E443:AEP/E445:AEP/E446CK:AEP)	
	3-865-543-61	MANUAL, INSTRUCTION(PORTUGUESE) (E440:7AEP/E441:AEP,AR1,C&SA/E441SR:AEP/E443:AEP/E445:AEP/E446CK:AR,AEP,C&SA)	
	3-865-543-71	MANUAL,INSTRUCTION(GERMAN)(E440:7AEP,G/E441:AEP,G/E441SR:AEP,G/E443:AEP,G/E445:AEP,G/E446CK:AEP,G)	
	3-865-543-81	MANUAL,INSTRUCTION(ITALIAN)(E440:7AEP/E441:AEP/E441SR:AEP/E443:AEP/E445:AEP/E446CK:AEP)	
	3-865-543-91	MANUAL,INSTRUCTION(FINNISH)(E440:7AEP/E441:AEP/E441SR:AEP/E443:AEP/E445:AEP/E446CK:AEP)	
	3-865-544-11	MANUAL, INSTRUCTION(ENGLISH)(E441:CN,E13/E443:E13/E445:CN,E13,HK/E446CK:E13)	
	3-865-544-21	MANUAL, INSTRUCTION(SIMPLIFIED CHINESE)(E441:CN/E445:CN)	
	3-865-544-31	MANUAL,INSTRUCTION(TRADITIONALCHINESE) (E441:E13/E443:E13/E445:E13,HK/E446CK:E13)	
	3-865-545-11	MANUAL, INSTRUCTION(RUSSIAN)(E441:EE/E441SR:EE/E445:EE/E446CK:EE)	
	3-865-545-21	MANUAL, INSTRUCTION(POLISH)(E441:EE/E441SR:EE/E445:EE/E446CK:EE)	
	3-865-545-31	MANUAL, INSTRUCTION(CZECH)(E441:EE/E441SR:EE/E445:EE/E446CK:EE)	
	3-865-545-41	MANUAL, INSTRUCTION(MAGYAR)(E441:EE/E441SR:EE/E445:EE/E446CK:EE)	
	3-866-293-11	MANUAL, INSTRUCTION(RUSSIAN) (E446CK:EE)	
	3-866-293-21	MANUAL, INSTRUCTION(CZECH)(E446CK:EE)	
	3-866-293-31	MANUAL, INSTRUCTION(MAGYAR) (E446CK:EE)	
	3-866-293-41	MANUAL, INSTRUCTION(POLISH)(E446CK:EE)	
	8-953-187-90	HEADPHONE MDR-ED136//K SET(E440/E441:EXCEPT US/E441SR/E443/E446CK:EXCEPT US)	
	8-953-272-90	HEADPHONE MDR-ED136SP//K SET (E445:EXCEPT US)	
	8-953-276-90	HEADPHONE MDR-24SP SET (E445:US/E449CK)	
	8-953-342-93	HEADPHONE MDR-24/1 SET (E441:US/E446CK:US)	

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